United States Department of Agriculture

Sullivan Creek Recreation Sites Project

Environmental Assessment

Forest Service	Colville National Forest	Newport-Sullivan Lake Ranger Districts	April 18, 2018

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CHAPTER 1: Introduction

The Colville National Forest, Newport-Sullivan Lake Ranger District is conducting this environmental assessment (EA) to analyze options to improve conditions at recreation sites along Sullivan Creek, in Pend Oreille County, Washington. Through this document, these sites are referred to as dispersed recreation sites (DRSs). Dispersed recreation is generally any recreation use that occurs in a natural setting outside a developed facility, site, trail, or area (campgrounds, picnic areas, roads, trails, etc.). However, many of the Sullivan recreation sites considered in this analysis have designated use areas and improvements not typical of most dispersed recreation sites on the Colville National Forest. Therefore, the project is referred to as the "Sullivan Creek Recreation Sites project" in this EA. The term "dispersed" is still used in certain supporting documents, maps, and plan sets.

The Sullivan Creek recreation sites are popular camping and day use sites distributed along the Sullivan Creek Road (National Forest System [NFS] Road 2220) and the Sullivan Lake Road (County Road 9345). Conditions at these sites have deteriorated in the past 10 years. Problems such as compacted soil, streambank erosion, increased stream sedimentation, vegetation trampling and loss, tree damage and mortality, vandalism, litter, and human waste accumulation are occurring.

This EA was prepared to determine whether the proposed treatments to the Sullivan Creek recreation sites may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement (EIS). Through the preparation of this EA, the Newport-Sullivan Lake Ranger District is fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA). This EA provides data and information from which the responsible official, (district ranger) can make a decision on treatment of the Sullivan Creek recreation sites to improve resource and recreation conditions.

Project Location

The Sullivan Creek watershed is the primary recreation area within the Boundary Hydroelectric Project vicinity. The watershed includes several campgrounds, day use areas, and numerous dispersed recreation sites (see recreation section for additional details).

The Sullivan Creek recreation sites are located between five and twenty miles east of Metaline Falls along the Sullivan Lake Road (County Road 9345) and the Sullivan Creek Road (NFS Road 2220) in Pend Oreille County, Washington. Recreation sites are situated along Sullivan Creek between North Fork Sullivan Creek at the western extent, and as far east as Gypsy Meadows in the Sullivan Creek headwaters (Figure 1). Legal project description is shown in Table 1.

Table 1. Legal description for the project area

Township	Range	Sections
39 N	43 E	23, 25, and 26
39 N	44 E	25, 32, 33, 34, and 35
39 N	45 E	3, 10, 16, and 19
40 N	43 E	12

The majority of the recreation sites are within close proximity to Sullivan Creek and are accessed by both paved and unpaved roads. Sullivan Creek is located within 2 subwatersheds (6th field HUs); HUCs 170102160402 and 170102160403. Sullivan Creek is the largest of 21 tributaries to Boundary Reservoir on the Pend Oreille River, with a drainage area of 143 mi^2 (R2, 2014). Sullivan Creek is 21.4 miles in length and drains the area to the east and northeast of Sullivan Lake.

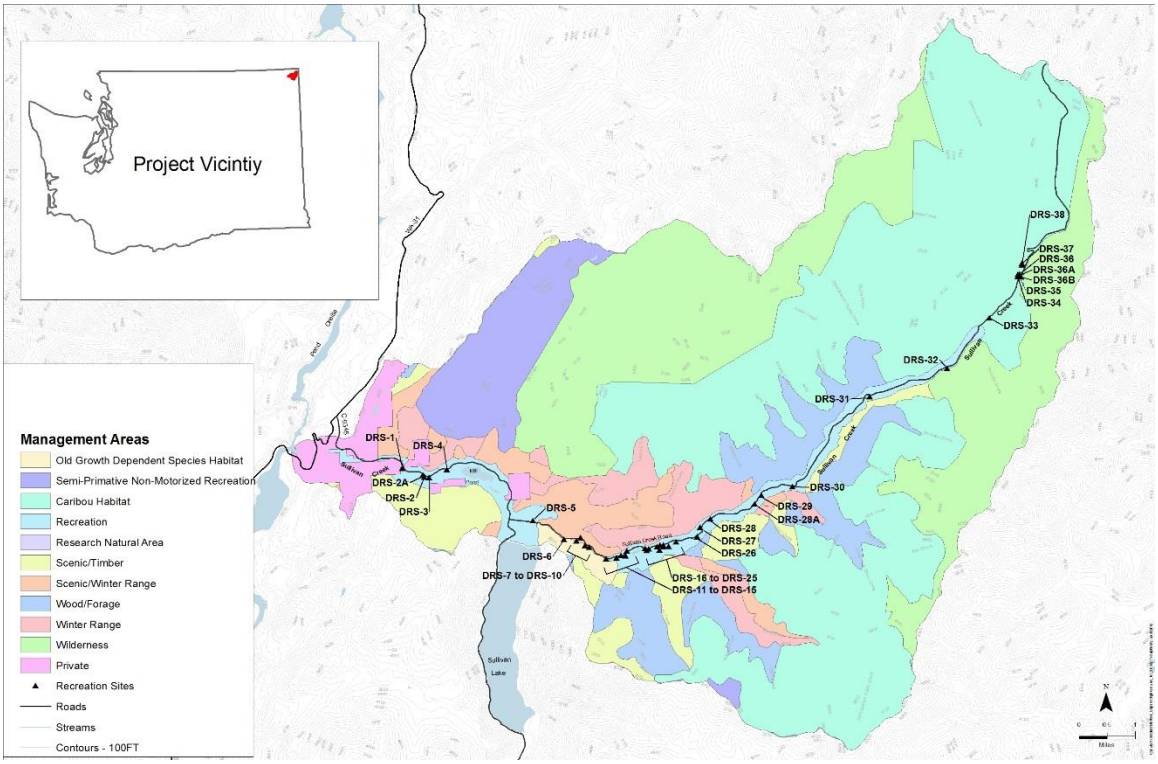

Figure 1. Project location and management areas

Purpose and Need

The Sullivan Creek Recreation Sites Project is part of a broad effort to recover native fish populations in Sullivan Creek and other tributaries that flow into Boundary Reservoir on the Pend Oreille River. Westslope cutthroat trout have declined in recent history from habitat loss and competition for food resources with non-native trout, primarily brook trout.

This project is a continuation of past efforts to minimize impacts from recreation use in the watershed. A 1996 watershed analysis identified campsites along Sullivan Creek as one of the primary impacts to aquatic and watershed function (USFS 1996). Between 1996 and 2011, barrier rocks and iceberging (a technique where angular rock (5-8 inches in diameter) is mixed with soil creating a surface unsuitable for tents) were installed throughout the project area and a handful of sites were closed in sensitive riparian areas to help reduce erosion, soil compaction, and degradation of the natural resources.

As a condition of the Boundary Hydroelectric Project (FERC Project No. 2144-038) License Settlement Agreement, Seattle City Light (SCL) agreed to restore aquatic habitat at 38 identified recreation sites on NFS Lands along Sullivan Creek. These 38 sites were identified by the Forest

Service and correspond with sites signed and numbered on the ground. The 38 sites represent a mix of campsites, day-use sites, and sites that have been closed to vehicles and overnight camping. The project is being completed in accordance with the Boundary Hydroelectric Project Fish and Aquatics Management Plan (FAMP), which was prepared by SCL to describe the measures that will be implemented over the relicensing period to protect fish and aquatic resources. The habitat restoration includes the improvement of resource conditions at the Sullivan Creek recreation sites, which directly affect native fish habitat and populations.

Soil compaction at recreation sites along Sullivan Creek and the resulting loss of streambank vegetation has caused increased bank instability and sedimentation throughout the creek system, further degrading aquatic and riparian habitat. Though currently only observed at the mouth of Sullivan Creek (Seattle City Light 2014), bull trout may move further into the system following the removal of and restoration at Mill Pond Dam (located at river mile 3.9 of Sullivan Creek). Currently, westslope cutthroat trout are considered a sensitive species by Region 6 of the U.S. Forest Service (USFS) and the U.S. Fish and Wildlife Service (USFWS) lists bull trout as threatened.

While the initial focus of the Sullivan Creek recreation sites project is to improve fish populations through improvement of streambank and floodplain conditions, the Forest Service also seeks to improve and maintain a sustainable recreation experience at the recreation sites through the project.

There is a need to define and delineate recreation sites along Sullivan Creek to minimize bank instability and soil erosion, minimize soil compaction outside of core recreation site areas, and to improve and maintain a sustainable recreational experience in the Sullivan Creek recreation sites. There is also a need to improve sanitation, and mitigate the potential for human-animal (e.g. grizzly bear) conflicts at the sites.

The purpose of the project is to:

- Improve watershed and aquatic function and native fish habitat in Sullivan Creek;
- Reduce the potential for human-bear conflicts;
- Maintain and improve long-term sustainable camping opportunities for the public.

Decision framework

Based upon the effects of the no action, proposed action, alternative 1, and alternative 2 as they relate to the purpose and need, public input, and the project file in its entirety, the responsible official will decide:

- *The Sullivan Creek recreation sites that will receive treatment;*
- *Specific treatments at each recreation site that will be applied to restore and improve watershed and aquatic function and maintain sustainable recreation opportunities for the public;*
- *The associated actions that will be included such as, collection of fees for site use, conversion of several closed roads to paths, noxious weed treatments, and specific provisions such as Best Management Practices and Design Elements.*

The decision will be based on:

- *How well the selected alternative achieves the need for the project;*
- *How well the selected alternative protects the environment and addresses issues and concerns;*
- *How well the selected alternative complies with relevant policies, laws and regulations.*

Management and Direction

This EA is guided by federal and state law, including the National Forest Management Act, the National Environmental Policy Act (NEPA), and the Clean Water Act. The NEPA requires analysis of projects to ensure the anticipated effects are considered prior to project implementation (40 CFR 1502.16). The analysis for the Sullivan Creek Recreation Sites Project followed the guidelines of NEPA as provided by the Council on Environmental Quality.

Colville National Forest Land and Resource Management Plan

The Colville National Forest Land and Resource Management Plan (Forest Plan) provides the guiding management direction for the project. This Environmental Assessment incorporates the Forest Plan and applicable goals, desired conditions, standards and guidelines by reference and is tiered to the Forest Plan's Final Environmental Impact Statement (USDA Forest Service 1988) and its amendments. The proposed action, alternative 1, and alternative 2 are consistent with the Forest Plan standards and guidelines, management area designations and prescriptions that apply to the Sullivan Creek Recreation Sites Project. A written description of the management areas within the project area follows. Management areas for each site and the Sullivan watershed are shown in Figure 1.

- **Management Area 1 Old Growth Dependent Species:** The goal is to provide essential habitat for wildlife species that require old growth forest components, and contribute to the maintenance and diversity of wildlife habitats and plant communities. This management area is characterized by a predominantly natural or natural appearing environment of 2,500 or more acres, with a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk. Motorized use is permitted.
- **Management Area 2 Caribou Habitat:** The goal is to manage woodland caribou habitat to provide sufficient suitable seasonal habitat to support the National Forest portion of a fully recovered population as specified in the Caribou Recovery Plan. This management area is characterized by a predominantly natural or natural appearing environment of 2,500 or more acres, with a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk. Motorized use is permitted.
- **Management Area 3A Recreation:** The goal is to provide roaded and unroaded recreation opportunities in a natural appearing setting. This management area is characterized by a predominantly natural or natural-appearing environment with a low probability of experiencing isolation from the sights and sounds of man. Interaction between users may be low to moderate, but with evidence of other users prevalent. Conventional motorized use is provided for in construction standards and design of facilities. Opportunities for both motorized and non-motorized forms of recreation may be provided.

- **Management Area 6 Scenic/Winter Range:** The goal is to provide a natural appearing foreground, middle, and background along major scenic travel routes while providing for big game winter range management. This management area is characterized by a predominantly natural or natural-appearing environment with a low probability of experiencing isolation from the sights and sounds of man. Interaction between users may be low to moderate, but with evidence of other users prevalent. Conventional motorized use is provided for in construction standards and design of facilities. Opportunities for both motorized and non-motorized forms of recreation may be provided.

Forest Plan Amendments

The Forest Plan includes amendments that are also management direction for this project including:

- Regional Forester's Forest Plan Amendment #2 entitled *Revised Interim Management Direction Establishing Riparian, Ecosystem and Wildlife Standards for Timber Sales* (USDA Forest Service 1995a). This amendment replaced the interim ecosystem and wildlife standards from Regional Forester's Forest Plans Amendment #1. In this interim direction, the Regional Forester directs National Forests in Eastern Washington to maintain, and, or enhance late and old structural stages in stands subject to timber harvest. Forest Plan Amendment #2 is hereafter referred to as the "Eastside Screens."
- *Inland Native Fish Strategy* (USDA Forest Service 1995b). This amendment replaced the interim riparian standard from Regional Forester's Forest Plans Amendment #1. The Inland Native Fish Strategy is hereafter referred to as "INFISH. INFISH provides standards and guidelines for recreation improvement projects to improve watershed function and habitat for native fish which drive the purpose and need for the project:
    - RM-1 Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of the Riparian Management Objectives and avoids adverse effects on inland native fish. Complete watershed analysis prior to construction of new recreation facilities in Riparian Habitat Conservation Areas within priority watersheds. For existing recreation facilities inside Riparian Habitat Conservation Areas, assure that the facilities or use of the facilities would not prevent attainment of Riparian Management Objectives or adversely affect inland native fish. Relocate or close recreation facilities where Riparian Management Objectives cannot be met or adverse effects on inland native fish cannot be avoided.
    - RM-2 Adjust dispersed and developed recreation practices that retard or prevent attainment of Riparian Management Objectives or adversely affect inland native fish. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective in meeting Riparian Management Objectives and avoiding adverse effects in inland native fish, eliminate the practice or occupancy.

Desired Condition

Desired conditions for hydrologic and aquatic resources from INFISH pertaining to the project include:

- Riparian Goal 1: maintain or restore water quality, to a degree that provides for stable and productive riparian and aquatic ecosystems.

- Riparian Goal 2 maintain or restore stream channel integrity, channel processes, and the sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which the riparian and aquatic ecosystems developed.
- Riparian Goal 5: maintain or restore diversity and productivity of native and desired non-native plant communities in riparian zones.
- Riparian Goal 6: maintain or restore riparian vegetation, to:
    - provide an amount and distribution of large woody debris characteristic of natural aquatic and riparian ecosystems;
    - provide adequate summer and winter thermal regulation within the riparian and aquatic zones; and help achieve rates of surface erosion, bank erosion, and channel migration characteristic of those under which the communities developed.

INFISH also includes Riparian Management Objectives (RMOs) which reflect desired future conditions of select stream channel attributes have been shown to represent functional aquatic habitat. INFISH RMOs include pool frequency, water temperature, large woody debris, bank stability, bank angle, and width/ depth ratio and are used to assess health of the system and project the minimum needed for good habitat. The goal of RMOs is to achieve a functional watershed and high level of habitat diversity and complexity through a combination of aquatic habitat features. RMOs are discussed in greater detail in the channel morphology section of this report.

The proposed action, alternative 1, and alternative 2 would meet or exceed standards outlined in these three amendments.

Public involvement

Public involvement is critical to project planning on the Colville National Forest. The Sullivan Creek Recreation Sites Project was first listed in the October, 2016 edition of the Colville National Forest Schedule of Proposed Actions (SOPA) and has appeared in the SOPA since that date. A scoping letter and map outlining the proposed action was mailed July 18, 2016 to members of the public, government officials, and other government agencies. A news release announcing project scoping appeared in the Newport Miner.

A total of 11 comments were received during the scoping period. These comments are posted on the website for the project and are available in the project record Comments were used to frame alternatives 1 and 2 through a process detailed in Chapter 2 of this document.

The Forest held a series of meetings with interested horse groups to discuss site design at Gypsy Meadows. Input from these meetings was used to formulate Gypsy Meadows (DRS-38) site design for all action alternatives. The Forest Service and Seattle City Light hosted a public field trip to select recreation sites. Discussion and comments from this field trip helped develop alternative 1.

Tribal Government to Government Consultation

Letters requesting government-to-government consultation were sent to the Confederated Tribes of the Colville Reservation, the Spokane Tribe, and the Kalispel Tribe of Indians on July 12, 2016. Input was received from the Spokane Tribe on July 20, 2016. The letter from the Spokane

Tribe stated that the project "has been determined to be in the Kalispel Tribe area", and deferred to the Kalispel Tribe.

A representative from the Kalispel Natural Resources Department is a member of the FAWG for the Boundary Hydropower License, which governs implementation of the Sullivan Creek Recreation Sites project. In this role, the Kalispel Tribe has participated in official review of the site plan for the proposed action and alternatives 1 and 2. The Kalispel Tribe has expressed support of the project as a member of the FAWG. The Confederated Tribes of the Colville Reservation did not comment on the project.

Other Agency Input

The Sullivan Creek Recreation Sites project is being completed to fulfill a license condition under the Boundary Hydroelectric Project as described in the FAMP. The FAMP is implemented by Seattle City Light in consultation with the Fish and Aquatics Working Group (FAWG), whose members include SCL and representatives from the U.S. Fish and Wildlife Service (USFWS), Bureau of Indian Affairs, Kalispel Tribe of Indians, U.S. Forest Service, Washington Department of Fish and Wildlife, Washington Department of Ecology, and the Selkirk Conservation Alliance or the Lands Council as an alternate participant, on behalf of the Hydropower Reform Coalition. These partners assisted the Forest Service and Seattle City Light in the formulation of the alternatives analyzed in this document

The scoping letter was mailed to the International Boundary Commission, United States Environmental Protection Agency, Department of Homeland Security Border Patrol, USFWS, U.S. Navy, and Washington State Departments of Ecology, Fish and Wildlife, Parks and Recreation, Transportation, and Natural Resources. A comment letter was received from the Department of Ecology. No additional comments from these agencies were received.

Pend Oreille County Participation

The Forest Service and Seattle City Light hosted several field trips and meetings to discuss the project with the Pend Oreille County Commissioners. Input from these meetings and scoping comments from the Commissioners were used to formulate the proposed action and alternative 1.

CHAPTER 2: Proposed Action and Alternatives

Introduction

This chapter describes the proposed action and alternatives for the Sullivan Creek Recreation Sites project. The following is a summary of the entire project, displaying the no action, proposed action, alternative 1, and design elements.

Alternative Summary

The Forest Service analyzed four alternatives in detail summarized below:

- The No Action Alternative: General treatment of the Sullivan Creek Recreation Sites was included in the FERC-issued Final Environmental Impact Statement (FEIS), in 2011 to address the effects of Seattle's Boundary dam relicense. However, the no action alternative for the purposes of this analysis assumes that there would be no additional treatment of the Sullivan Creek recreation sites as a means to compare alternatives in this analysis. The no action alternative is the only alternative where fees are not proposed. There are a total of 45 overnight campsites along Sullivan Creek under the no action alternative.
- The Proposed Action Alternative: The proposed action alternative was developed by the Forest Service and Seattle City Light to address the purpose and need of the project within the constraints of the Forest Plan. The proposed action would install restoration treatments at the Sullivan Creek recreation sites and includes the installation of a new restroom at the Moon Flat site. The proposed action also includes charging a fee for camping at designated sites. There would be a total of 38 overnight campsites along Sullivan Creek under the proposed action.
- Alternative 1: This alternative modifies the proposed action based on comments received from the public, Pend Oreille County Commissioners, Washington Department of Ecology, and Forest Service Interdisciplinary Team analysis. Alternative 1 adds design features and amenities commensurate with fees proposed at each site, updates the site plan at Gypsy Meadows to better accommodate equine use, and clusters campsites around new and existing restrooms. There would be a total of 43 overnight campsites along Sullivan Creek under alternative 1.
- Alternative 2: This alternative would allow camping at sites outside the floodplain (the area adjacent to Sullivan Creek) and within close proximity to a restroom facility. Day use sites outside the floodplain would remain open. All other sites would be closed and rehabilitated to minimize resource impacts to soil, water, fisheries, and riparian areas. Improvements in sites that would remain open would be the same as alternative 1. There are a total of 29 overnight campsites along Sullivan Creek under alternative 2.

Alternative Considered but Eliminated from Detailed Study

Placement of Additional Restroom Facilities

In addition, the four alternatives considered in detail, the district ranger considered the placement of additional restroom facilities at the North Fork Site (DRS-1), and/or in the vicinity of DRSs 15-19, based on public scoping comments. Hydrologic analysis at the North Fork site indicates that aquatic restoration cannot be achieved while maintaining a site footprint to facilitate overnight camping. In addition, there is not an appropriate location for a restroom facility at this

site. There would be a restroom installed at the nearby Moon Flat Site (DRS-2) in the proposed action, alternative 1, and alternative 2 that could accommodate day users from the North Fork site. Installation of a restroom facility in the vicinity of DRSs 15-19 was removed from further consideration because an appropriate location within close enough distance to more than one campsite could not be located.

Alternatives 1 and 2 and the "Placement of Additional Restroom" alternative considered but eliminated from detailed study address all the public comments received from the project.

One additional comment received from the Washington Department of Ecology regarding the use of trees from the riparian area along Sullivan Creek for stream restoration. This activity is outside the scope of this project and was not analyzed in this analysis.

Detailed Alternative Descriptions

Background and Supporting Documentation

This section includes a detailed description of each alternative and outlines the proposed treatment each site by alternative. Supporting site plans, site descriptions and site numbering system varies by alternative. There are three site numbering systems used to track sites in this analysis. Existing Forest Service number reflects the on-the-ground site numbering system. The dispersed recreation site (DRS) numbering system reflects the original 38 recreation sites referred to in the Tributary Management Plan for the Boundary Hydropower License and includes new recreation sites (5 or more depending on alternative). The final site number is included in alternatives 1 and 2 and provides a coherent numbering system for management of the recreation sites once the project is implemented. The "final site" numbering system uses a place name approach to name sites and sequentially numbers the sites on Sullivan Creek upstream from the Sullivan Lake Ranger Station. Sites clustered around a restroom facility include a place name and a sequential lettering system. General site numbering system and location of supporting site plan and site descriptions by alternative are shown in Table 2. Table 5 compares site numbers by alternative for each site. Appendix E compares site numbers, number of overnight campsites, estimated site size, total vehicle capacity, and amenities for each site and each alternative.

Table 2. Site numbering system and site plan and description location by alternative

Alternative	Numbering System	Site Plan Documentation	Site Descriptions
No Action	DRS, Existing Forest Service Number	No detailed stand-alone site plans. General site footprint and feature locations are outlined in the EA, the Proposed Action Restoration Plan, and the Proposed Action Site Plan (Appendices A and B)	Existing condition is described in the EA, the Proposed Action Restoration Plan, and the Proposed Action Site Plan (Appendices A and B)
Proposed Action	DRS, Existing Forest Service Number	Proposed Action Restoration Plan and the Proposed Action Site Plan (Appendices A and B)	Described in the Proposed Action Restoration Plan and the Proposed Action Site Plan (Appendices A and B)
Alternative 1	DRS, Existing Forest Service Number, final site number	Restoration Plan for Alternative 1 and Alternative 1 Site Plan (Appendices C and D)	Described in the Restoration Plan for Alternative 1 and Alternative 1 Site Plan (Appendices C and D)

Alternative	Numbering System	Site Plan Documentation	Site Descriptions
Alternative 2	DRS, Existing Forest Service Number, Final site number	Sites to remain open would follow the designs in the Restoration Plan for Alternative 1 and Alternative 1 Site Plan (Appendices C and D).	Described in the EA

No Action

Under the no action alternative, the existing recreation sites along Sullivan Creek would remain and current management would continue. User-created features including fire rings, parking, and trails would remain. Fees would not be charged for overnight or day use. Potential hazard trees would remain, and additional hazard trees would develop over time. The footprint of many sites could continue to expand, and erosion, sedimentation, and compaction would continue at current or increased levels depending on use patterns. No new restroom facilities would be installed. A description of the current status and site impacts of each site addressed in this project per the Tributary Management Plan for the Boundary license analyzed in the no action alternative is described in Appendix A. All sites that are currently open to camping would remain open under the no action alternative, and all sites that are currently closed to camping would remain closed. There are approximately 45 campsites under the No Action, however as documented in Appendix A, several sites are in poor condition. Appendix A includes a detailed description and photos of existing condition each site, Appendix B includes drawings of existing site footprints.

Proposed Action

The proposed action includes treatment of the 38 sites originally identified in the license for the Boundary Hydroelectric Project. In addition, five new recreation sites for camping would be developed to replace closures at several existing sites that are degraded and located in the floodplain, where resource impacts cannot be mitigated through site design. Appendix E shows to total number of overnight campsites and vehicle capacity for the proposed action and compares these metrics across alternatives. The Proposed Action Restoration Plan (Appendix A) provides a detailed description of the proposed treatment for each recreation site. Appendix B includes site plans and design specifications for each recreation site. Location and general treatment descriptions are shown in Figure 2.

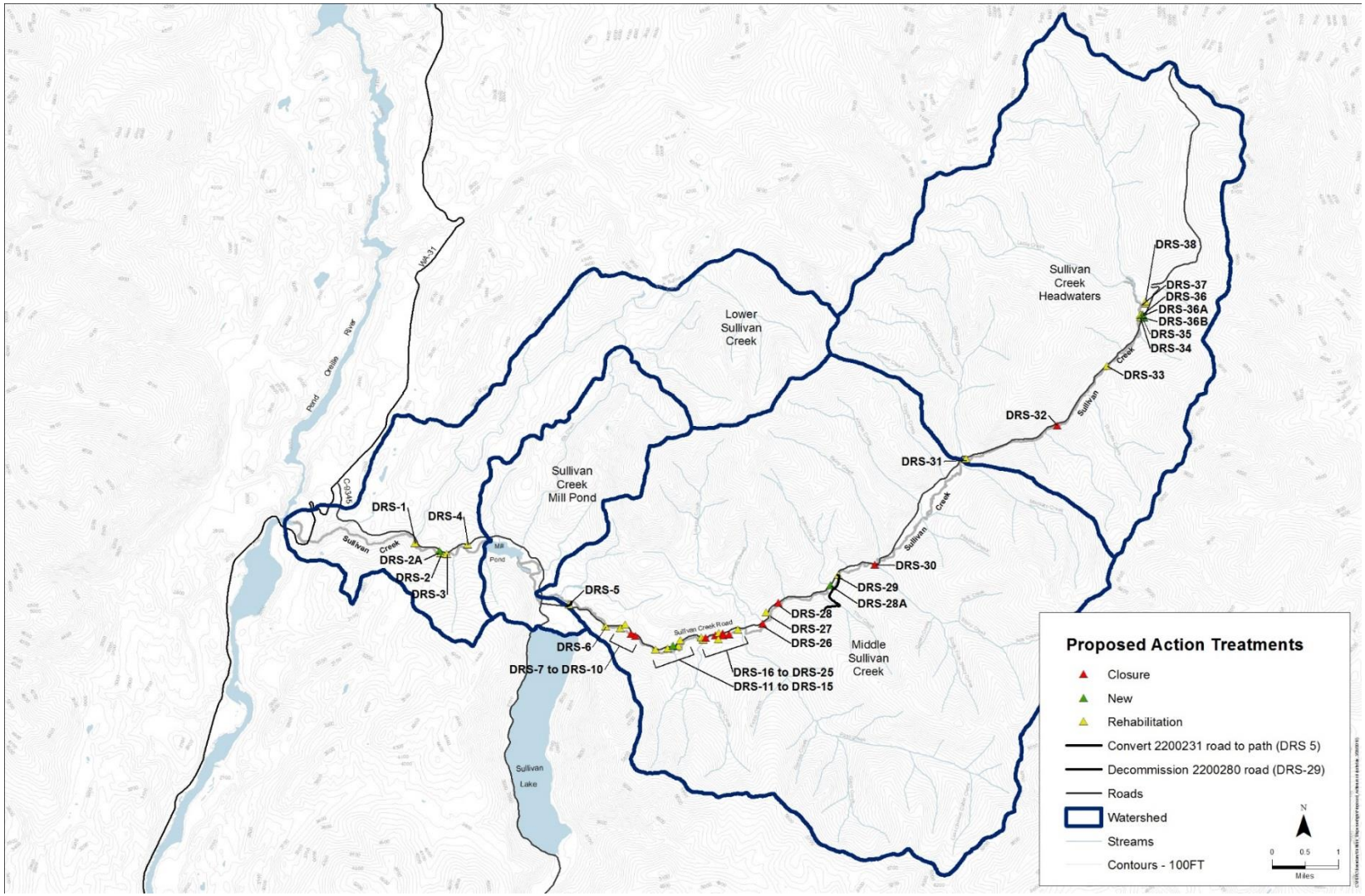

Figure 2. Location and general treatment descriptions for the proposed action (based on DRS numbering system)

Proposed site treatments include one or more of the following types of activities to restore habitat and provide for long-term sustainable camping opportunities for the public:

- Relocate and/or install campfire rings in locations that minimize ecological impacts, potential fire hazards and provides a more sustainable and enjoyable camping experience at the site;
- Relocate and/or add bear boxes in locations conveniently close to parking areas to help promote responsible behaviors and safe food storage;
- Install barrier rock to clearly delineate parking areas and define camping use areas for easier pubic access to sites;
- Iceberg certain areas to delineate camping areas and encourage revegetation of impacted areas. Iceberging is a technique where angular rock (5-8 inches in diameter) is mixed with soil creating a surface unsuitable for tents;
- Decompact soils, including ripping of un-needed access routes and compacted soils to encourage revegetation;
- Replant streambanks, riparian zones, and/or other impacted areas to reduce erosion and sedimentation, promote ecological function, and delineate safe public access paths;
- Fully or partially (convert to day use only) close degraded sites in the floodplain when other restoration actions are not feasible. Closure techniques would include placement of barrier rock, iceberging, and plantings.

Specific treatments that would be applied to each site are detailed in the Proposed Action Restoration Plan (Appendix A) and the Proposed Action Site Plan (Appendix B).

The core areas within many campsites would be reduced in size to provide for single family site opportunity and areas outside the core (where use is causing resource impacts) would be restored to more natural conditions (with trails to points of interest remaining). Additionally, the proposed action includes enhancing the recreation opportunity through improved campsites, updated visitor information (sign boards), animal proof storage lockers, and new fire rings, where needed. These improvements would encourage a small group/family oriented experience while restoring the natural setting and improving wildlife and stream habitat.

In order to provide improved management of the Sullivan Creek recreation sites, the Forest Service would collect camping fees of approximately $5.00-$7.00 per night per single-family site. This fee would offset the cost of providing long-term maintenance of the facilities (including four existing and one new proposed vault toilet), help fund future replacement of installed amenities (fire rings and bear boxes), increase public safety and assistance patrols, and mitigate safety hazards. Fee would also address a scoping comment from the Washington Department of Ecology regarding the use of firewood from riparian areas. This fee would allow for increased Forest Service presence at the sites, which would decrease unauthorized firewood collection.

Connected actions associated with the proposed action (detailed in Appendices A and B) include:

- Conversion of NFS Road 2200231 to an access path at DRS-5. The road is currently an open Maintenance Level 2 road;
- Decommissioning of NFS Road 2200280 at DRS-27. The road is currently a closed Maintenance Level 1 road;

- Felling of hazard trees within the project area, and clearing of vegetation for construction of new recreation sites.

Road connected actions are shown in Figure 2.

Alternative 1

Alternative 1 modifies the proposed action based on internal and public and agency comments from the Pend Oreille County Commissioners, WA Department of Ecology, and members of various horse groups. A summary of comments received and how comments/issues were addressed in alternative 1 are shown in Table 3.

Table 3. Scoping comments and updates made to the proposed action in alternative 1 based on comments and issues

Comment/Issue	How comments/issues are addressed in alternative 1
The proposed action does not adequately address sanitation issues at the recreation sites.	Alternative 1 adds additional camping opportunities at sites near restrooms (DRS-8, Conto Gulch sites, Moon Flat sites, John's Creek sites, and Gypsy Meadows sites). Alternative 1 closes the North Fork Sullivan site (DRS-1) to camping and open to day use to mitigate damage to soil and water at the site. Fees charged would provide funding for an increased Forest Service presence in the area to help with visitor education and enforcement of sanitation regulations in the area.
Fees should only be charged where amenities are commensurate with the fee scale.	Alternative 1 adds additional camping opportunities at sites near restrooms (DRS-8, Conto Gulch sites, Moon Flat sites, John's Creek sites, and Gypsy Meadows sites). In addition, alternative 1 includes site upgrades including installation of fire rings, food storage lockers, improvement of parking areas, improvement of vehicle access routes, and improvement of management/security, and to help meet requirements for Forest Service fee implementation.
Gypsy Meadows site plan does not adequately address horse camp use at the site.	The design in alternative 1 at Gypsy Meadows was updated from the proposed action through field collaboration with horse group representatives and the public. The Gypsy Meadows site plan adds an additional campsite, includes an area for a large kitchen and keeps the meadow open for large work parties.
The proposed action does not adequately address impacts from sites within the floodplain or within close proximity to Sullivan Creek. For example, DRS-17 is located in the floodplain of Sullivan Creek and includes a relict side channel. Reconnection of this area with the main channel of Sullivan Creek has a high benefit to stream channel function and fish habitat.	The North Fork Sullivan site (DRS-1) would be closed to camping and open to day use only, to improve sanitation and minimize erosion, sedimentation, soil compaction, and impacts to riparian vegetation. Site would be monitored and adaptively managed to ensure that day uses impacts to these resources are within acceptable levels. DRS-17 would be closed to camping and day use in alternative 1 to facilitate aquatic restoration in Sullivan Creek (being completed by Seattle City Light) through placement of large woody debris to reconnect the relict floodplain to Sullivan Creek. Additional campsites were added to Conto Gulch and Johns Creek in alternative 1 to help offset this closure.
Final site design should facilitate sustainable recreation—signage, host site, trash collection, accessibility, and minimization of user conflicts.	Alternative 1 includes an updated numbering system that reflects place names and makes site locations more intuitive to the public and for managers. Alternative 1 site design includes appropriate requirements for accessibility, and includes plans for a potential camp host site (within DRS-14/Conto Gulch).

Alternative 1 responds to comments received on the proposed action, and differs from the proposed action in the following ways:

- Includes an updated site numbering system for sites open to camping (Final Site Numbers);
- Conversion of the North Fork Sullivan site (DRS-1) to day use only to improve sanitation and minimize erosion, sedimentation, soil compaction, and impacts to riparian vegetation. Site would be monitored and adaptively managed;
- Increase in camping sites at the Moon Flat sites, DRS-14 (Conto Gulch), DRS-20 (John's Creek), and Gypsy Meadows to maximize the number of camping sites near restroom facilities and improve sanitation;
- Updates to the Gypsy Meadows site plan, including a new group kitchen area for horse group work parties, installation of additional highline poles, and installation of two interpretive signs describing the history of the Civilian Conservation Corps at the site;
- Closure of DRS-17 to camping and day use to facilitate stream restoration in adjacent reach of Sullivan Creek;
- Construction of a campground complex host site at DRS 14;

The Restoration Plan for Alternative 1 (Appendix C) provides a detailed description of existing condition of each existing recreation site, photos, and a description of the proposed treatment in alternative 1. Appendix D includes site plans and specifications for each recreation site in Alternative 1. General site treatments and connected actions for alternative 1 are shown in Figure 3.

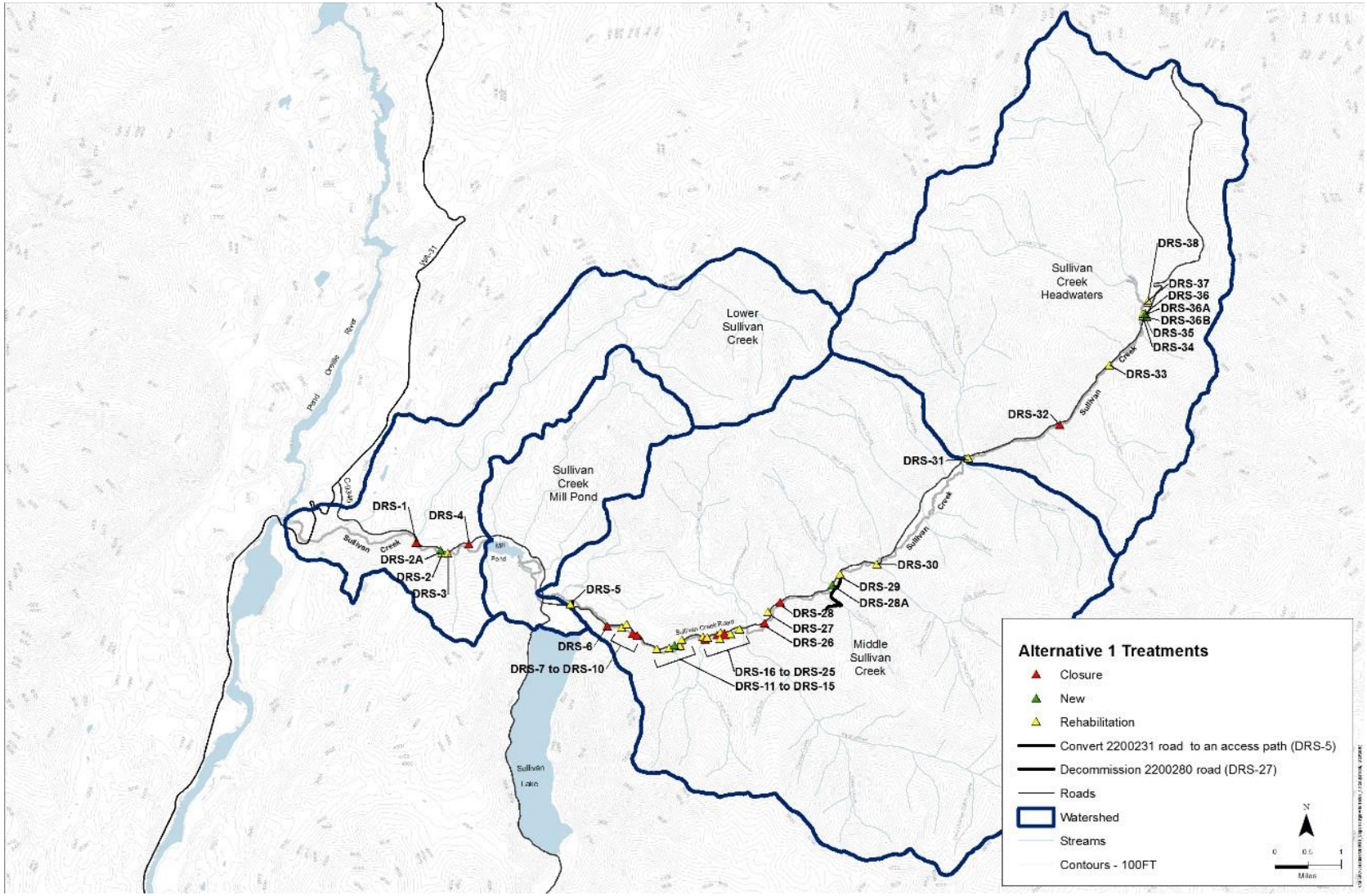

Figure 3. Alternative 1 site treatments

Alternative 2

Alternative 2 was developed to improve watershed and aquatic function and native fish habitat in Sullivan Creek, through removal of recreation sites along Sullivan Creek. Alternative 2 would only allow camping at sites outside the Sullivan Creek floodplain (generally across the Sullivan Creek Road from Sullivan Creek) and within close proximity to a restroom facility. Day use sites outside the floodplain would also remain open. All other sites would be closed and rehabilitated to minimize resource impacts to soil, water, fisheries, and riparian areas.

Table 4. Scoping comments and updates made to the proposed action in alternative 2 based on comments and issues

Comment/Issue	How comments/issues are addressed in alternative 2
The proposed action does not adequately address sanitation issues at the recreation sites.	Alternative 2 would close all sites to camping on Sullivan Creek not located near a restroom to improve sanitation along Sullivan Creek. Similar to alternative 1, alternative 2 adds additional camping opportunities at sites near restrooms (DRS-8, Conto Gulch sites, Moon Flat sites, John's Creek sites, and Gypsy Meadows sites). Fees charged in alternative 2 would provide funding for an increased Forest Service presence in the area to help with visitor education and enforcement of sanitation regulations in the area.
Fees should only be charged where amenities are commensurate with the fee scale.	Similar to alternative 1, alternative 2 adds additional camping opportunities at sites near restrooms (DRS-8, Conto Gulch sites, Moon Flat sites, John's Creek sites, and Gypsy Meadows sites). In addition, alternative 1 includes site upgrades including installation of fire rings, food storage lockers, improvement of parking areas, improvement of vehicle access routes, and improvement of management/security, and to help meet requirements for Forest Service fee implementation.
The proposed action does not adequately address impacts from sites within the floodplain or within close proximity to Sullivan Creek. For example, DRS-17 is located in the floodplain of Sullivan Creek and includes a relict side channel. Reconnection of this area with the main channel of Sullivan Creek has a high benefit to stream channel function and fish habitat.	The North Fork Sullivan site (DRS-1) would be closed to camping and open to day use only, to improve sanitation and minimize erosion, sedimentation, soil compaction, and impacts to riparian vegetation. Site would be monitored and adaptively managed to ensure that day uses impacts to these resources are within acceptable levels. DRS-17 would be closed to camping and day use in alternative 1 to facilitate aquatic restoration in Sullivan Creek (being completed by Seattle City Light) through placement of large woody debris to reconnect the relict floodplain to Sullivan Creek. Additional campsites were added to Conto Gulch and Johns Creek in alternative 1 to help offset this closure.
Final site design should facilitate sustainable recreation—signage, host site, trash collection, accessibility, and minimization of user conflicts.	Alternative 2 includes a numbering system that reflects place names and makes site locations more intuitive to the public and for managers. Alternative 1 site design includes appropriate requirements for accessibility, and includes plans for a potential camp host site (within DRS-14/Conto Gulch). Sites clustered around restrooms in alternative 1 are located to minimize conflict around restroom use.

Sites remaining open (within close proximity to a restroom, and outside the Sullivan Creek floodplain) would follow designs in alternative 1 (see Appendices C and D). Alternative 2 would provide a sustainable recreation experience at open sites; however, recreation opportunities would be more limited than in all other alternatives.

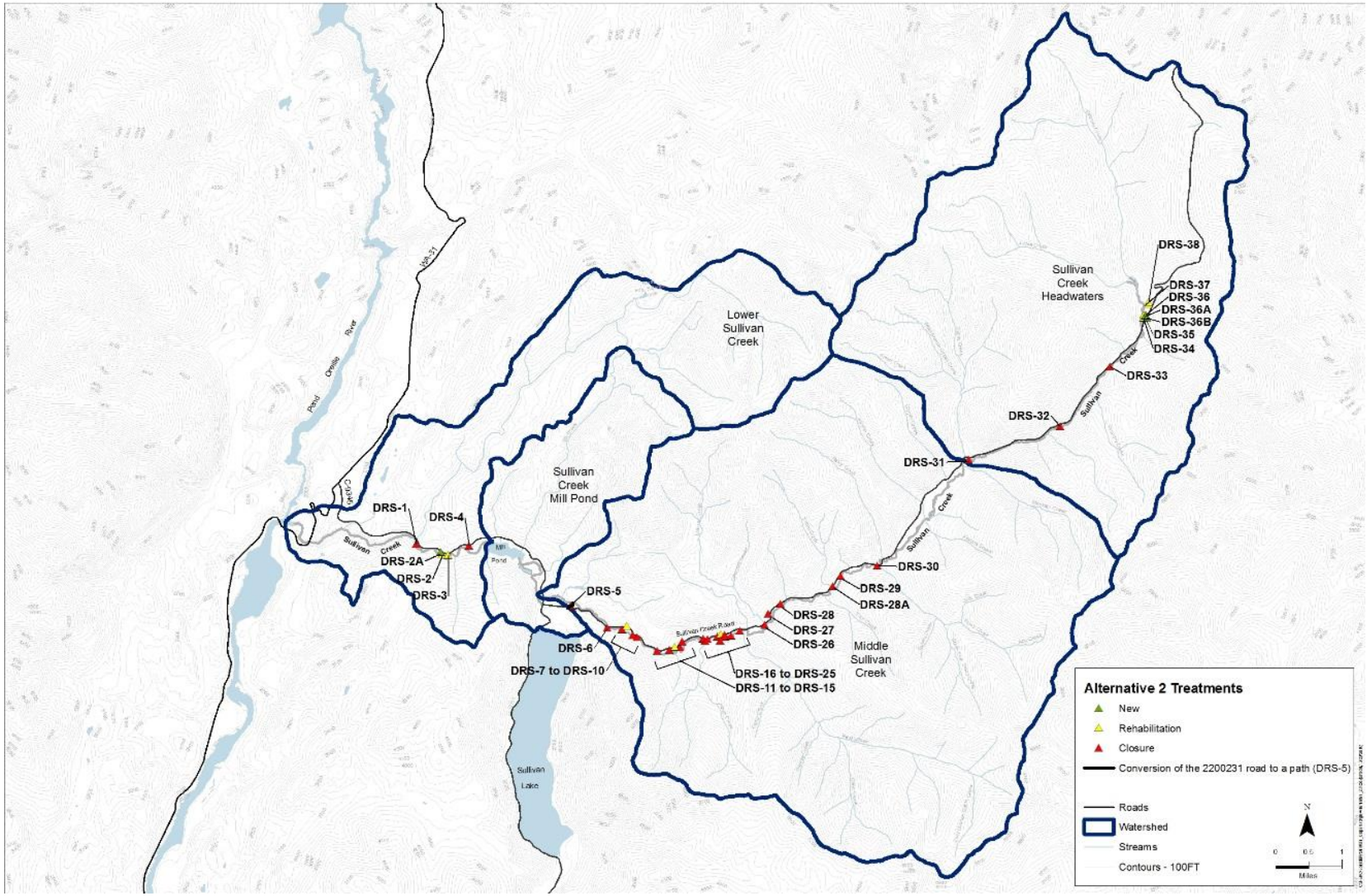

Figure 4. Alternative 2 site treatments

Comparison of Alternatives

A comparison of site treatments and site numbering across alternatives is shown in Table 5.

Table 5. Comparison of site treatments and number of campsites at each recreation site by action alternative

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
1	NA	North Fork Sullivan Creek	3	Large site would remain open to overnight camping, delineation of parking and vehicle access areas, iceberg to focus camping in select locations, revegetate streambanks, remove user-defined campfire rings, formalize stream access, add informational kiosk, metal campfire rings and bear boxes.	4	Site would be converted to day use with parking to accommodate 5+ vehicles, walking paths through the site, and walking paths and kayak launch accessing Sullivan Creek. Features in the site would meet accessibility guidelines.	0	Site would be closed to camping and day use.	0
2 and 2A	MF	Moon Flat 1-5	1	Large site would remain open to camping, delineation of parking and vehicle access, iceberg to focus camping in select location, remove user-defined campfire rings, add metal campfire rings, bear boxes, and a CXT restroom.	2	Two new sites would be created for camping for a total of 5 sites. Installation of CXT restroom. Delineation of parking and vehicle access, iceberg to focus camping in select location, remove user-defined campfire rings, add metal campfire rings, and bear boxes. Features in the site would meet accessibility guidelines.		Same as alternative 1. Site would remain open with a total of 5 campsites.	

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
3	MF	Moon Flat 6	1	Medium site would remain open. Delineation of parking and vehicle access, create turnaround, light iceberging to focus camping in select location, remove user-defined campfire rings, add metal campfire ring and bear box, and formalized foot access to Creek.	1	Medium site would remain open. Delineation of parking and vehicle access, create larger turnaround than then the Proposed Action, light iceberging to focus camping in select location, remove user-defined campfire rings, add metal campfire ring and bear box, and formalized foot access to Creek. Features in the site would meet accessibility guidelines.	1	Same as alternative 1. Site would remain open.	1
4	NA	n/a	1	Small site would remain open to camping. Barrier rock would be installed at top of access route. Access route would be ripped for 100 ft. beyond the barrier rock. Installation of fire ring and bear box.	1	Small site would remain open for day use only. Turnaround would be installed. Barrier rock would be installed at top of access route. Access route would be ripped for 100 ft. beyond the barrier rock and at 36 in wide walking access path would be maintained. Features in the site would meet accessibility guidelines.	0	Site would remain open to day use.	0
5	1	Sullivan Creek 1	2	NFS Road 2200231 would be converted to a 36 in wide footpath, and ripped and	1	NFS Road 2200231 would be converted to a 36 in wide footpath, and	1	Site would be closed to camping and	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				revegetated. The lower use area would be open for day use only. Barrier rock would delineate parking and vehicle access in the large upper use area. User-defined campfire ring would be removed, and bear box would be relocated. New metal fire ring would be installed.		ripped and revegetated. The lower use area would be open for day use only. Barrier rock would delineate parking and vehicle access in the large upper use area. User-defined campfire ring would be removed, and bear box would be relocated. New metal fire ring would be installed. Use area would be larger in alternative 1 than the proposed action.		open for day use.	
6	2	n/a	0	Site would remain closed to overnight camping and open to day use. Existing boulders would remain in place. User-defined campfire ring would be removed and pedestrian access to the creek would be maintained. Existing tent area on north side of Sullivan Creek Road would remain. Accessibility at this day use site is not feasible based on steep terrain.	0	Largely the same as the proposed action. Existing tent area on north side of Sullivan Creek Road would be removed.	0	Site would be closed to camping and open for day use.	0
7	3	Sullivan Creek 2	1	Small site would remain open to camping. Barrier rock would be installed to delineate parking, and iceberging would be used to	1	Similar to the proposed action, with additional measures to ensure that features in the site would	1	Site would be closed to camping and day use.	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				define use areas. Metal fire ring would be installed. Pedestrian access to the Creek would be maintained.		meet accessibility guidelines.			
8	4	Sullivan Creek 3 and 3a	1	Small site would remain open to camping. Barrier rock would be installed to limit vehicle use of user-defined paths between the bear box and Sullivan Creek Road. Remove user-defined campfire ring and install new metal campfire ring.	1	Additional campsite would be added near existing CXT restroom converting small site to medium-sized site. Treatment of existing campsite similar to the Proposed Action. Features in the site would meet accessibility guidelines.	2	Same as alternative 1. Site would remain open with a total of 2 campsites.	2
9	5	n/a	1	Site would be closed to camping and day use. Additional barrier rocks would be placed to prohibit vehicle access. Access route would be ripped and re-vegetated. Iceberg the primary use area and user-defined campfire ring would be removed.	0	Same as the proposed action. Site would be closed to camping and day use.	0	Same as the proposed action and alternative 1. Site would be closed to camping and day use.	0
10	6	n/a	2	Site would be closed to camping and day use. Additional barrier rocks would be placed to prohibit vehicle access. Iceberg and rip areas without mature trees to allow natural revegetation. Streambanks	0	Same as the proposed action. Site would be closed to camping and day use.	0	Same as the proposed action and alternative 1. Site would be closed to	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				would be revegetated. User-defined campfire ring would be removed.				camping and day use.	
11	7	Sullivan Creek 4	1	Medium site would be converted to a small site through iceberging and addition of barrier rock to delineate vehicle access areas. User-defined campfire rings would be removed, and a metal campfire rings and bear box would be installed. Pedestrian access routes to the Creek would be defined and streambank would be revegetated along unneeded access routes.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
12	8	Sullivan Creek 5	1	Medium site would be converted to a small site through iceberging at the use area in the active floodplain. Barrier rock would be installed to delineate parking and provide a turn-around. User-defined campfire ring would be removed and bear box would be relocated. Pedestrian access to the creek would be maintained and defined, and	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines. Installation of 35 ft. radius turn-around.	1	Site would be closed to camping and day use.	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				streambank would be revegetated where needed.					
13	9	Sullivan Creek 6	1	Medium site would be converted to a small site through installation of barrier rock to delineate. Iceberging and revegetation techniques would be used to delineate use areas. Remove user-defined campfire ring and install metal campfire ring. Relocate bear box. Maintain pedestrian access from the site to the Creek.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines. Installation of 35 ft. radius turn-around.	1	Site would be closed to camping and day use.	0
14	10	Conto Gulch 1-6	2	Medium site would be expanded to include four sites, each with a bear box, metal fire ring, and parking. User-defined campfire rings would be removed, and barrier rock would be placed to delineate appropriate use areas. New access road would be constructed to create pull-through loop.	4	Medium site would be expanded to include six sites, each with a bear box, metal fire ring, and parking. One site would provide amenities for a seasonal camp host. User-defined campfire rings would be removed, and barrier rock would be placed to delineate appropriate use areas. New access road would be constructed to create pull-through loop. Features in the site would meet accessibility guidelines.	6	Site would be closed to camping and day use.	6

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
15	11	Sullivan Creek 7	1	Small site would remain open to camping. Barrier rocks would be installed to define and delineate appropriate use areas. User defined campfire ring would be removed, and a bear box and metal campfire ring would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
16	12	Sullivan Creek 8	1	Small site would remain open to camping. Barrier rocks would be installed to define and delineate appropriate use areas. User defined campfire ring would be removed, and a bear box and metal campfire ring would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
17	13	n/a	2	Large site would remain open to camping with use zones delineated out of the active stream channel migration zone. Barrier rocks would delineate parking areas. Western and eastern lobes of use would be iceberged, with a small tent area within the eastern lobe. Two pedestrian access paths would be maintained. User-defined campfire ring would be removed and replaced with a metal	1	Site would be closed to day use and camping. Side channel of Sullivan Creek within the site footprint will be reactivated through the Sullivan Creek Stream Restoration Project.	0	Same as Alternative 1. Site would be closed to camping and day use.	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				campfire ring, and a bear box would be installed.					
18	n/a	n/a	0	Site would remain open to day use and barrier rock would be installed to delineate appropriate vehicle use areas.	0	Same as the proposed action. Site would be open for day use and closed to camping.	0	Site would be closed to camping and day use.	0
19	14	n/a	1	Site would remain open to day use and barrier rock would be installed to delineate appropriate vehicle use areas (along the road shoulder). Pedestrian access to the Creek from the Sullivan Creek Road would be defined and maintained. Site would be iceberged to promote natural revegetation, and streambank would be revegetated. User-defined campfire ring would be removed.	0	Same as the proposed action. Site would be open for day use and closed to camping.	0	Site would be closed to camping and day use.	0
20	15	John's Creek 1-6	1	Medium site would remain open to camping. Barrier rock would be installed to delineate parking and use areas. User defined campfire ring would be removed, and a bear box and metal campfire ring would be installed.	1	Five additional campsites would be added to maximize use around existing CXT restroom. A new access route would be constructed to connect existing sites and several new site to the restroom. Features in the site would meet	6	Same as alternative 1. Site would remain open with a total of 6 campsites.	6

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
						accessibility guidelines. Site 21A in the proposed action becomes part of Site 20 in alternative 1.			
21	17	n/a	1	Site would remain open to day use. Site would be iceberged, streambank would be re-vegetated, and user-defined campfire ring would be removed. A 36 in wide walking path would be maintained to access Sullivan Creek.	0	Same as the proposed action. Site would be open for day use and closed to camping.	0	Site would be closed to camping and day use.	0
21A	n/a	n/a	1	New campsite would be installed near the existing CXT restroom adjacent to DRS-20. Barrier rock would be used to delineate site and parking area. Metal campfire ring and bear box would be installed.	2	DRS-21A site plan from the proposed action is included in DRS-20 site plan in alternative 1.	Included in the John's Creek campsite count	DRS-21A site plan from the proposed action is included in DRS-20 site plan in alternative 2.	Included in the John's Creek campsite count
22	18	n/a	1	Site would be closed to all recreational uses. Barrier rock would be maintained and iceberging would be used to promote natural revegetation. User-defined campfire ring would be removed, and streambanks would be revegetated.	0	Same as the proposed action. Site would be closed to day use and camping.	0	Site would be closed to camping and day use.	0
23	19	Sullivan Creek 9	1	Large site would be converted to a medium site	1	Similar to the proposed action, with additional	1	Site would be closed to	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				through installation of barrier rock to delineate parking and use areas. The western use area would be iceberged and the spur road would be ripped and replanted. User-created vehicle loop would be closed with boulders and slash. User-defined campfire rings would be removed, and a new metal campfire ring would be installed.		measures to ensure that features in the site would meet accessibility guidelines. In addition, user-created vehicle loop would be ripped in addition to installation of boulders and slash. A 36 in wide walking path would be maintained on the 2200500 spur.		camping and day use.	
24	20	n/a	0	Site would remain closed to all uses, and measures would be taken to more effectively close the site. Additional barrier rocks would be installed, existing paths would be ripped and planted. User-defined campfire ring would be removed. Earthen berm would be installed to restrict vehicle access.	0	Same as the proposed action. Site would remain closed to camping and day use.	0	Same as the proposed action and alternative 1. Site would remain closed to camping and day use.	0
25	21	Sullivan Creek 10	2	Large site would be converted to a medium site through installation of barrier rock to delineate parking and turn-around areas. Iceberging would be used along the periphery of the current use area.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				Streambank would be revegetated. Metal campfire ring and bear box would be installed. Pedestrian path from the site to Sullivan Creek would be maintained.					
26	23	n/a	1	Site would remain closed to camping and day use. Features would be installed to effectively close the site. Barrier rocks would be added to improve closure. Access route would be ripped and revegetated. User-defined campfire rings would be removed. Primary use areas would be iceberged, and streambank would be revegetated.	0	Same as the proposed action. Site would remain closed to camping and day use.	0	Same as the proposed action and alternative 1. Site would be closed to camping and day use.	0
27	24	Sullivan Creek 11	1	Medium site would remain open to camping. Barrier rocks would be installed to delineate and define use area. User-defined campfire ring would be removed, and metal campfire ring and bear box would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to overnight use.	0
28	25	n/a	1	Site would be closed through placement of additional barrier rock, iceberging the primary use area, revegetating the disturbed streambank, and	0	Same as the proposed action. Site would be closed to camping and day use.	0	Same as the proposed action and alternative 1. Site would be closed to	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				removing user-defined campfire rings.				camping and day use.	
28A	n/a	Sullivan Creek 12	0	Site would be improved to create a campsite. Barrier rocks would be installed to delineate pull-out and limit vehicle access to the site. Iceberg to focus camping in select locations. Retain a single user-defined trail to Sullivan Creek. Install a metal campfire ring and bear box.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
29	26	Sullivan Creek 13	2	Site adjacent to Sullivan Creek Road and Sullivan Creek would be closed through installation of barrier rock and slash and removal of user-defined campfire ring. Small site across the non-drivable Pass Creek bridge would be open to camping, and metal campfire ring and bear box would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
30	n/a	n/a	0	Site would remain open to day use and remain closed to camping. Barrier rocks would be added to limit vehicles, and the site would be iceberged to define appropriate use areas. Pedestrian access would be	0	Same as the proposed action. Site would remain open to day use.	0	Site would be closed to camping and day use.	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				maintained in a single access path to the Creek.					
31	28	Sullivan Creek 14	2	The large site would be converted to a medium site in the upper use area. Barrier rock would be installed to delineate parking and use areas. The lower site would be ripped and iceberged; two pedestrian access paths would be retained. User-defined campground rings would be removed, and a metal campfire ring and bear box would be installed. The propane tank would be retained and protected in place.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
32	29	n/a	1	Small site would be open to day use through installation of barrier rock, iceberging and revegetation of degraded areas. User-defined campground rings would be removed, and a metal campfire ring and bear box would be installed. Pedestrian access to the Creek would be retained.	0	Same as the proposed action. Site would remain open to day use.	0	Site would be closed to camping and day use.	0

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
33	n/a	Sullivan Creek 15	1	Small site would be retained for camping. The lower use area would be iceberged, and barrier rock would be installed to delineate use areas. A tent area would be created, and pedestrian access to the Creek would be maintained. User-defined campground rings would be removed, and a metal campfire ring and bear box would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Site would be closed to camping and day use.	0
34	n/a	Lower Gypsy Meadows 1	1	Site would remain open to camping. Barrier rock would be installed to delineate appropriate use areas, and areas adjacent to the side channel would be iceberged. Gravel would be installed to define parking and improve road drainage. User-defined campground rings would be removed, and a metal campfire ring and bear box would be installed. Pedestrian access to the side channel would be retained.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Same as alternative 1. Site would remain open to camping with one site.	1
35	n/a	Lower Gypsy Meadows 2	1	Medium site would remain open to camping. Barrier rock would be used to delineate use areas. The	1	Similar to the proposed action, with additional measures to ensure that features in the site would	1	Same as alternative 1. Site would remain open	1

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
				eastern vehicle access path would be ripped and revegetated. Iceberging would be used to delineate the site, and pedestrian access to the creek would be retained. User-defined campground rings would be removed, and a metal campfire ring and bear box would be installed.		meet accessibility guidelines.		to camping with one site.	
36	n/a	Lower Gypsy Meadows 3	1	Medium site would remain open to camping. Barrier rock would be installed to delineate use areas, and pedestrian access to the CXT restroom and nearby campsites would be retained. User-defined campground rings would be removed, and a metal campfire ring and bear box would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Same as alternative 1. Site would remain open to camping with one site.	1
36 A	n/a	Lower Gypsy Meadows 4	0	A new small campsite would be established. Vegetation would be cleared, a tent area would be created, and gravel would be installed to create a parking area. A metal campfire ring and bear box would be installed.	1	Similar to the proposed action, with additional measures to ensure that features in the site would meet accessibility guidelines.	1	Same as alternative 1. A new small campsite would be established.	1
36 B	n/a	Lower Gypsy	1	Site would be developed into a medium-sized campsite. A	1	Similar to the proposed action, with additional	1	Same as alternative 1.	1

DRS number	Existing Forest Service Number	Final Site Number	No Action # of campsites	Proposed Action	Proposed Action # of campsites	Alternative 1	Alternative 1 # of campsites	Alternative 2	Alternative 2 # of campsites
		Meadows 5		tent area would be created, and gravel would be installed to create a parking area. A metal campfire ring and bear box would be installed.		measures to ensure that features in the site would meet accessibility guidelines.		A new medium-sized site would be established.	
37 and 38	GM	Upper Gypsy Meadows 1-3	2	Site would be managed as one large site with several use areas for overnight camping and horse use. A designated kitchen area would be defined at the western edge of the meadow. Equestrian access would be maintained to Sullivan Creek. Campfire rings and bear boxes would be moved to the eastern side of the meadow. Barrier rock would be installed to control vehicle access to culturally sensitive areas. Site along Sullivan Creek would be iceberged and creek banks would be planted. A gate would be installed to control vehicle access to the site and facilitate horse group use of the site.	2	Site would include 3 primary camping sites, each with a bear box and metal fire ring. Main meadow area would remain open for horse camping. Two additional highlines would be added in the northeast corner of the site. Informational kiosks would be installed at the site entrance and near the existing concrete pad in the northeast portion of the site.	2	Same as alternative 1. Site would include 3 primary camping areas and the meadow would remain open for horse camping.	2

Design Elements Common to all Action Alternatives

The following Design Elements apply to all treated areas and are an integral part of Sullivan Creek Recreation Sites project and would be carried out if the project is implemented. The effects analyses in Chapter 3 are based on implementation of these Design Elements and the Best Management Practices.

Noxious Weeds

The intent of the noxious weeds design elements is to reduce the risk of noxious weed establishment and provide long-term soil cover.

Revegetate areas disturbed by construction or within the footprint of camping site being closed when soil cover is less than 50 percent after treatment. Locally collected native plant materials are the first choice in revegetation.

Equipment will be cleaned prior to use on NFS lands.

Noxious weeds that occur within the project area and on Forest Service routes used to access the project area would be treated at least a season prior to any ground disturbing activities. Post-disturbance noxious weed treatments need to occur where weeds exist or have been introduced.

Cultural Resources

The intent of the heritage design criteria is to protect cultural resources and to comply with the National Historic Preservation Act.

Avoid all historic properties during implementation. A minimum 20-meter buffer is required on all sites as established by a certified archeologist. Previously undocumented sites (inadvertent discovery) may be discovered during the course of implementation. Project personnel must notify the forest archeologist if there is an inadvertent discovery of archeological resources within the treatment area. In such an instance, operations are to cease until a certified archeologist can develop mitigations. All equipment must stay out of the known boundaries of sites. Trees will be felled away from the interior boundaries of cultural properties.

Sensitive Plants

The intent of the sensitive plants design elements is to protect sensitive plants that occur in the project area.

If sensitive plant species are found in the project area while project activities are occurring, the forest botanist or their designee would be consulted as to measures required to protect the species and its essential habitat.

Clearly mark work zone boundaries to prevent disturbance of potentially undetected rare plants and violet species (listed as “sensitive”, but fairly common) in the margins of undisturbed habitat adjacent to the DRSs.

Water Quality and Aquatic Function

The intent of these design elements is to protect water quality.

Dust abatement, in the form of water, will be used, if needed. If the use of chemicals is requested, then a hydrologist or fisheries biologist will be consulted.

All refueling sites will be located outside the riparian habitat conservation area (RHCA).

Parking, and staging areas will be located outside the RHCA unless there is no other suitable location. In that case, a hydrologist or fisheries biologist will be consulted on all proposed landing locations in RHCAs

Monitor throughout the recreation season for breaches in barrier rocks and repair breaches as soon as possible.

Monitor throughout the recreation season for expansion of campsites especially near stream banks. If sites are expanding, mitigate expansion using additional iceberging, plantings, and other measures identified in the proposed action.

Wildlife

Pack out all food, garbage, and other attractants from work sites each day. Camp only at sites approved by the Forest Service. Follow the CNF Food Storage Order to reduce the potential for human / bear conflicts. Follow any fire restrictions in effect and any other pertinent FS regulations (e.g., sanitation, discharging of firearms, etc.).

Avoid operating heavy equipment from December 1 to July 30. The intent would be to minimize the potential for the project to disturb and displace wildlife during critical periods as follows;

a. Wintering period for big game (December 1-March 31),

b. Critical spring period for bears following den emergence (April 1 – June 15),

c. Nesting period for harlequin ducks (April 15 – July 30),

d. Nesting period for landbirds (April 15 - July 15).

Render any new equipment access roads / trails un-drivable, as work is completed on the routes. Rip / sub-soil the routes, and incorporate boulders, earthen berms, logs, and plantings, as needed to make effective closures

Retain all existing snags, defective live trees, and down logs to the extent feasible. If down logs need to be cut for equipment operation, retain the longest pieces possible.

If a TES species is observed or an activity site (den, nest, rendezvous site, etc.) is discovered in the vicinity of a project work site, the Forest Service biologist would be consulted as to any measures required to protect the species or site.

Recreation

Monitor for vandalism to facilities and other infrastructure (restrooms, signs, kiosks, food storage lockers, etc.). Graffiti should be removed and repairs made as soon as possible to prevent the spread of vandalism.

Monitor for damage to trees from carving, bark removal, cutting, etc. throughout the recreation season (annual hazard tree monitoring will occur in the spring of each year. Educational signs should be posted where vandalism is present to inform campers of the effects to the trees and natural resources.

Monitor for the development of new user-created sites and paths within the Sullivan Creek Recreation Sites and surrounding areas. Take appropriate actions to close, harden, or manage new sites or developments as appropriate.

Monitor for sanitation issues near campsites (toilet paper, trash, buckets, etc.). Future mitigation measures may be needed such as “self-contained use only” policy or increased enforcement efforts.

Monitor site use to determine if additional corrective actions or site use change (i.e.- conversion of site from day use only to open to camping) is needed.

Monitor each recreation site yearly for hazard trees.

CHAPTER 3: Environmental Consequences

Introduction

This chapter presents information about current resource conditions in the Sullivan Creek Recreation Sites project area, and the direct, indirect, and cumulative effects of implementing the no action and the action alternatives. The information presented in this chapter and in the specialists' reports is based on the best available science, field review, and professional judgement. These effects along with the entire project file, which is incorporated by reference, are the scientific and analytic basis for the responsible official's decision.

The District Ranger determined that recreation, hydrology, fisheries, and wildlife are the resources most likely affected, warranting detailed analysis in this EA (potential effects summarized section XX). Other resources/issues considered by the Forest Service IDT, but not warranting detailed analysis in this EA are briefly discussed in the Other Resources Considered and Findings section of this EA.

Past, Present, and Reasonably Foreseeable Projects

A variety of past, present, and reasonably foreseeable projects have occurred, are occurring, or are planned to occur in the vicinity of the Sullivan Creek Recreation Site Project. Past activities include timber harvest, road and trail building and maintenance, construction of weirs in Sullivan Creek and its tributaries, wildland fire, landslide stabilization on the Sullivan Creek Road, installation of a coldwater pipe to decrease temperatures in Outlet Creek, and replacement of culverts on Wasson and Kinyon Creeks, removal of a culvert on John's Creek, and removal of Mill Pond Dam. Ongoing activities include dispersed and designated recreation, suction dredge and placer mining in Sullivan Creek and tributaries, brook trout suppression activities, and road and trail maintenance. Reasonably foreseeable projects include stream restoration and wood placement in eight reaches of Sullivan Creek upstream of Mill Pond and one reach of Wasson Creek, brook trout suppression in Highline Creek, restoration of Mill Pond reach of Sullivan Creek, several landslide stabilizations along Sullivan Creek near Mill Pond, wood placement and stream restoration downstream of Mill Pond Dam, and reconstruction of the Sullivan Creek Road.

The Noisy fire burned approximately 4,000 acres in summer/fall 2017. The Noisy fire reached portions of Sullivan Creek and burned at low to moderate severity through DRSs 9 and 10. In addition, the Hughes Meadow fire burned within the Sullivan Creek subwatershed at the same time as the Noisy fire; however, none of the recreation sites were affected by this fire.

Hydrology

This section discusses the affected environment, existing conditions, and the direct, indirect, and cumulative effects of the Sullivan Creek Recreation Sites project on water quality, riparian function, channel stability, floodplain function, and soil stability. This section incorporates by reference the Sullivan Creek Recreation Sites specialist report (Day 2017).

The Sullivan Creek Recreation Sites project addresses the need to minimize bank instability, soil erosion and compaction, and other processes that impact aquatic and wildlife habitat at recreation sites along Sullivan Creek.

Protection and improvement of hydrologic function at the Sullivan Creek recreation sites is one of the primary drivers of the project, and is needed to improve native fish populations in Sullivan Creek by reducing impacts from overuse and informal expansion of recreation sites along Sullivan Creek.

Relevant Laws, Regulations, and Policy

Regulatory Framework

Clean Water Act

The principal law governing pollution in the nation's streams, lakes, and estuaries is the Federal Water Pollution Control Act (P.L. 92-500, enacted in 1972), commonly known as the Clean Water Act (CWA). The CWA is the primary federal law that protects the nation’s waters, including lakes, rivers, aquifers and coastal areas from point and non-point source pollution. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters through regulation of point and non-point source water pollution.

Through the CWA, the Environmental Protection Agency (EPA) requires each state to provide guidance and direction for the protection and restoration of water bodies (40 CFR 131.12). In Washington, the EPA has designated authority for compliance with the CWA to The Washington Department of Ecology (Ecology). As required under the CWA, Ecology identifies beneficial uses and develops water quality standards to protect beneficial uses for waters across the State. Designated beneficial uses established for national forests, wilderness areas, and national parks in Washington include; salmon and trout spawning, core rearing and migration, extraordinary primary contact recreation, extraordinary primary contact recreation, domestic, industrial, and agricultural water supply, stock watering, wildlife habitat, harvesting, boating, and aesthetic values (WAC 173-201A-200; Baldwin 2006).

Section 303(d) of the Clean Water Act and EPA regulation (40 CFR 130.2(J), and 130.7), delegate the authority to list waters that do not meet water quality standards or beneficial uses to individual states. Washington determines its 303(d) list through the water quality assessment process, which is completed every 2 years. Once a water body is listed as impaired on the 303(d) list, it is Ecology’s responsibility to develop a Total Maximum Daily Load (TMDL) for each pollutant of concern. A TMDL is a quantitative plan and analysis procedure for attaining and maintaining water quality standards and specifies the total load of pollutant a waterbody can carry and still meet beneficial uses. The TMDL and associated Water Quality Implementation Plan (WQIP) outline the process through which beneficial uses can be met through the identification of sources of pollutants, and actions that lead to improved water quality (40 CFR 130.2(H)).

A 2000 Memorandum of Agreement (MOA) between Ecology and Region 6 of the U.S. Forest Service designates the USFS as the management agency for meeting CWA requirements on NFS lands. Through this MOA the FS is responsible for ensuring that all waters on NFS lands meet or exceed water quality laws and regulations and that activities on NFS lands are consistent with protections provided in Washington Administrative Code and relevant state and water quality requirements (USDA FS and WADoE, 2000). The MOA recognizes the contribution of existing FS direction, including the Interior Columbia Basin Ecosystem Management Project (ICBEMP), INFISH, and BMPs in meeting water quality laws and regulations, and states that the Forest service and Ecology will collaborate to address 303(d) listings through the development of

TMDLs and WQIPs (USDA Forest Service and WADoE, 2000). While the 2000 MOA has not been updated, the CNF and Ecology continue to manage CWA compliance under this MOA.

To meet the goals outlined in the MOA and comply with the CWA, Ecology and the Colville National Forest produced a TMDL and WQIP for temperature, bacteria, pH, and dissolved oxygen and Water Quality Implementation Plan (WQIP) (WADoE 2006) for waters on the Colville National Forest on the 1998 303(d) list that were not meeting water quality standards. EPA approved the TMDL and WQIP for fecal coliform and temperature in 2005 (EPA, 2005, Whiley and Baldwin 2005). The TMDL for pH and dissolved oxygen was not approved by the EPA at this time because the submittal report lacked some of the required components in the dissolved oxygen and pH analysis (Baldwin 2006).

Sullivan Creek is on the 2014 303(d) list for dissolved oxygen; testing of dissolved oxygen in 2008, 2009, and 2010 showed several samples below the 9.5mg/L standard. Sullivan Creek is included in the Colville National Forest TMDL based on exceedance of the 7-day mean daily maximum temperature of 12°C in 2008 and 2010.

The Sullivan Creek Recreation Sites project is compliant with the Colville National Forest TMDL, WQIP, and Clean Water Act. Consistent with the Colville NF TMDL, the project manages recreation use to protect and promote riparian vegetation, and water quality (including temperature and dissolved oxygen). The project moves and contains recreation sites and user-created trails away from Sullivan Creek, and improves sanitation along Sullivan Creek. The effects analysis section of this report evaluates how each alternative complies with the Clean Water Act.

Resource Indicators and Measures

Resource indicators to assess potential direct, indirect, and cumulative effects to hydrologic resources include sediment delivery potential, riparian area condition, sanitation, floodplain function adjacent to recreation sites, soil erosion, and compaction (Table 6). Measures to assess these indicators include riparian area condition rating, temperature, number of campsites with restroom access, floodplain function rating, and a soil compaction and potential erosion rating.

Table 6. Resource indicators and measures for assessing effects

Resource Element	Resource Indicator	Measure
Water quality, riparian function, and channel stability	Sediment delivery Riparian area condition	Riparian area condition rating
	Sanitation	Number of campsites with restroom access
	Stream channel function	Analysis of INFISH RMOs including pools, large wood, and width to depth ratio
	Temperature	Qualitative discussion of potential project effects on temperature
Floodplain function	Floodplain connectivity	Floodplain function rating
Soil Stability	Soil Erosion and compaction	Soil compaction and potential erosion rating

Methodology

This analysis provides an estimated quantitative risk rating based on field analysis to compare the condition of riparian vegetation, floodplain function and connectivity, soil compaction, and soil erosion across the Sullivan Creek recreation sites by alternative as a means to compare potential effects to water quality, riparian function, and channel stability, floodplain function, and soil stability.

A rating system is used in this report to categorize and assess each measure based on existing condition and anticipated condition following treatment for each alternative. Ratings assign quantitative values based on qualitative analysis of site conditions. These values are not absolute, and are presented as a means to compare alternatives.

Riparian area measure rating criteria:

- 3: Riparian vegetation is not present, or does not provide adequate sediment and other pollutant buffer or effective shade. Sediment from the site enters the adjacent stream.
- 2: Riparian vegetation is present and provides moderate buffering of sediment and other pollutants between the site and the stream and provides moderate shade. Moderate sediment from the site enters the adjacent stream.
- 1: Riparian area is provides an effective buffer for sediment and other pollutants between the site and the stream, and effective shade. Sediment from the site does not enter the adjacent stream. A value of 1 is also assigned if the site is located on the opposite side of the Sullivan Creek Road and Sullivan Creek.

Floodplain function rating criteria:

- 3: 100-75% of site is within the floodplain
- 2: <75% of the site is within the floodplain
- 1: Site is located out of the floodplain

Soil compaction and potential erosion rating criteria:

- 3: Large site with compacted soils. Site is likely to expand with increased use.
- 2: Medium to large site with compacted soils within site footprint. Site is generally not likely to expand with increased use.
- 1: Small to medium site with compacted soils only within the site footprint. Site is not likely to expand with increased use.

Each site was assigned a score for each measure for existing condition, and a score after proposed treatment under the proposed action and alternative 1 and 2. The composite score for each alternative (and each site and measure) is compared across alternatives. The highest possible composite score for each site is 9, the highest composite score for each measure across all sites is 117, and the highest composite score for all measures across all sites is 351. Percent decrease of each alternative relative to existing condition was calculated for each measure.

The sanitation measure is calculated the percentage of campsites with nearby restroom access. This measure is not included in the composite score calculation. Scores and percentage of campsites with nearby restroom access are compared across alternatives to determine relative improvement of each measure to compare alternatives.

Spatial and Temporal Context for Effects Analysis and Watershed Hierarchy

The Sullivan Creek Recreation Sites project is located in the Headwaters Sullivan Creek (HUC 170102160402) and the North Fork Sullivan Creek-Sullivan Creek (HUC 170102160403) subwatersheds. The watershed hierarchy of these subwatersheds is shown in Table 7.

Table 7. Watershed hierarchy of the project area

Basin	Subbasin	Watershed	Subwatershed
Pend Oreille River 170102	Pend Oreille River 17010216	Sullivan Creek 1701021604	Headwaters Sullivan Creek 170102160402
			North Fork Sullivan Creek-Sullivan Creek 170102160403

The hydrologic analysis area for the Sullivan Creek Recreation Sites project is the Headwaters Sullivan Creek and North Fork Sullivan Creek-Sullivan Creek subwatersheds. Direct and indirect effects are analyzed at the scale of all National Forest System lands in these subwatersheds. The temporal scale for effects analysis is 10 years—the time it is estimated to take for morphological and water quality improvements from the project to be measureable. Cumulative effects are analyzed for all lands within these subwatersheds at the same temporal scale as direct and indirect effects.

Existing Condition

Riparian Function and Channel Morphology

Riparian Function

Although riparian areas comprise a small portion of lands in the Sullivan Creek drainage, they provide important ecological function and habitat for plants and aquatic and terrestrial wildlife (Wissmar 2004). Riparian areas provide a linkage between upland and stream habitats and are important habitat for aquatic and terrestrial wildlife and a variety of plants. Vegetation production is generally higher in wetland and riparian ecosystems than in the uplands, and riparian structure and function influence the rate, amount, and timing of discharge of water, sediment, nutrients, and other potential pollutants (Kovalchik and Clausnitzer 2004).

Riparian areas act as a filtration system for overland water and sediment runoff before it enters the stream system. This function is especially important where watersheds have experienced disturbance or management that alters the routing of water and sediment upslope of the riparian area. Trees and shrubs in riparian areas create shade, regulate air, soil, and water temperature, and provide inputs of downed trees and woody debris to the stream system (Wissmar 2004). Roots of riparian vegetation provide bank stability and slow the rate of erosion and potential channel migration (Gregory et al. 1991). Riparian vegetation also slows flowing water during high flow

events, trapping sediment within the floodplain (Platts et al, 1985), resulting in a reduction in the sediment load in flood water (Wondzell 2001).

Riparian vegetation provides stream shade, reducing stream temperature. The 2006 Colville National Forest TMDL reports that Sullivan Creek requires 64% effective shade to achieve the 16°C temperature standard in place at the time. The Washington Department of Ecology estimates that to meet the current standard of 12°C may require 100% effective shade.

INFISH designates riparian habitat conservation areas (RHCAs) as areas where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. RHCAs help maintain the integrity of aquatic ecosystems by 1) influencing the delivery of coarse sediment, organic matter, and woody debris to stream, 2) providing root strength for channel stability, 3) shading the stream, and 4) protecting water quality (Naiman et al. 1992).

Channel Morphology

Large woody debris (LWD), pool frequency and quality, channel substrate, width to depth ratio, and bank condition are the primary parameters that are affected by upstream and near-stream watershed processes. A brief description of these parameters follows. A detailed analysis of channel morphology in Sullivan Creek is located in the Fisheries and Aquatic Management Plan (Seattle City Light, 2010), the Boundary Hydroelectric Project Tributary Management Plan (Seattle City Light, 2014), and the Sullivan Creek Large Wood Conceptual Implementation Plan (Seattle City Light, 2017).

INFISH RMOs applicable in forested systems include pool frequency, water temperature, LWD, and width to depth ratio are assessed below for Sullivan Creek. Bank stability and lower bank angle apply in non-forested systems, and are not analyzed in this report. RMOs in tributaries to Sullivan Creek are not assessed in this report; the project is not expected to change conditions or have direct, indirect, or cumulative effects on tributaries to Sullivan Creek.

Table 8. INFISH RMOs applicable to the Project

Habitat Feature	Interim Objective									
Pool Frequency (key feature)	Wetted width (ft.)	10	20	25	50	75	100	125	150	200
	Pools per mile	96	56	47	26	23	18	14	12	9
Water Temperature (supporting feature)	No measurable increase in maximum water temperature (7-day moving average of daily maximum temperature measured as the average of the maximum daily temperature of the warmest consecutive 7-day period). Maximum water temperatures below 59F within adult holding habitat and below 48F within spawning and rearing habitats.									
Large Woody Debris (forested systems)	>20 pieces per mile; >12 inch diameter; >35 foot length									
Width /Depth Ratio (supporting feature)	Mean wetted width divided by mean depth, <10									

Large Woody Debris

Large woody debris (LWD) contributes hydraulic roughness to stream channels, which increases flow resistance providing a wide range of geomorphic effects (Manga and Kirchner, 2000), including reduction in flow velocity, increases in water surface elevation, and localized deposition of sediment (Abbe and Montgomery, 2003 and Brummer et al., 2006). The systematic removal of

stable large wood from western rivers for navigation and transport of timber, and from riparian zones for timber harvest, has therefore had a major influence on the geomorphic function of most rivers in the Pacific Northwest region (Collins *et al.*, 2002; Fox and Bolton, 2007; Phelps, 2011), including Sullivan Creek. Analysis of LWD in Sullivan Creek indicates that while several reaches have adequate LWD, many reaches lack the wood needed for quality aquatic habitat and aquatic function (Seattle City Light 2017a, Northwest Hydraulic Consultants 2013). Sullivan Creek currently meets the INFISH RMO objective for LWD in most reaches, but habitat and aquatic function could be improved with the addition of LWD in select reaches.

Pool Frequency and Quality

Pool frequency and the quality of pools (primarily depth and pool substrate) are indicators of functional stream systems. Pool frequency and quality are influenced by changes in watershed processes—roads, timber harvest, and dispersed camping along stream channels can increase bank erosion, channel downcutting, channel widening, and sedimentation, which decreases the frequency and quality of pools. Upslope watershed processes also affect pool frequency and water quality through changes in amount and timing of runoff, peak flows, and erosion. These changes can incise and widen channels, decreasing pool frequency and depth. LWD is a primary determinant of pool frequency and quality—streams with less LWD often have decreased pool frequency and quality. Delineation of channel habitat units (pool, riffle, glide, cascade) was completed in 2013 using LiDAR data for Sullivan Creek. This analysis indicates the pools make up 22% of total stream length (Northwest Hydraulic Consultants, 2013). Several reaches in Sullivan Creek are lacking pools, especially in low gradient reaches where more pools would be expected. While this does not translate directly to the INFISH RMO pool frequency metric, this number indicates that Sullivan Creek is deficient in pools for a stream of its width.

Channel Substrate

Fine sediment is a natural component of stream channel substrate; however, watershed disturbance can increase fine sediment and impact aquatic habitat conditions. Accelerated sedimentation can also increase channel instability, incision, and widening and contribute to stream channel disconnection from the adjacent floodplain. Stream surveys in Sullivan Creek indicate that fine sediment is generally within acceptable levels, however there are localized areas of increased fine sediment in Sullivan Creek (Seattle City Light 2017a).

Width to Depth Ratio

Width to depth ratio is valuable measurement to describe channel cross-section shape and energy distribution. Channels with wider bankfull width to depth ratios are wide and shallow, placing additional stress on stream banks during high flow events. While the RMO for width to depth ratio is measured as a wetted width to depth, bankfull width to depth is a better measure of width to depth because it is not dependent on flow conditions at the time of survey. Bankfull width to depth ratio rather than wetted width to depth ratio is reported here. Bankfull width to depth ratios range from 17 to 24 in Lower Sullivan Creek to an average of 17 in the Sullivan Creek headwaters (Seattle City Light 2017a). A bankfull width to depth ratio is considered average for Sullivan Creek, while a bankfull width to depth ratio of 24 is considered high. While wetted width to depth ratio was not measured for this analysis, the measured bankfull width to depth ratios indicate that most reaches of Sullivan Creek do not meet this INFISH RMO for wetted width to depth ratio (<10). These values indicate that Sullivan Creek is wider and shallower than expected in several reaches, likely resulting from past land use practices.

Entrenchment and Floodplain Connection

Entrenchment is the degree to which a stream is connected to the adjacent floodplain. Streams that are entrenched are incised with steep unstable banks. In non-entrenched channels, water spills onto the adjacent floodplain, dissipating the potential erosional effects of high flows on stream channels. In entrenched streams, high flows rarely spill onto the adjacent floodplain resulting in bank and channel instability. Several reaches of Sullivan Creek are entrenched and disconnected from the floodplain. Certain recreation sites along Sullivan Creek are located in the active floodplain.

Temperature

One of the primary goals of the project is to improve watershed and aquatic function in Sullivan Creek. Project treatments to focus use outside of riparian areas and off of streambanks, reduce soil erosion and compaction, reduce tree vandalism and mortality, and revegetate streambanks are expected to improve the watershed functions that improve stream temperatures.

Sullivan Creek is included in the Colville National Forest TMDL based on exceedance of the 7-day mean daily maximum temperature of 12°C in 2008 and 2010. Data collected by Seattle City Light at seven sites in Sullivan Creek upstream from the Outlet Creek confluence from 2012 to 2016 indicate temperatures exceeding the 7-day mean daily maximum temperature of 12°C at all sites for all years sampled (Seattle City Light, 2017(c)).

The Sullivan Creek Recreation Sites project is compliant with the Colville National Forest TMDL, WQIP, and Clean Water Act. Consistent with the Colville NF TMDL, the project manages recreation use to protect and promote riparian vegetation, and water quality. The project moves and contains recreation sites and user-created trails away from Sullivan Creek, and improves sanitation along Sullivan Creek. The effects analysis section of this report evaluates how each alternative complies with the Clean Water Act.

Existing Condition

Deteriorating conditions at the Sullivan Recreation sites were initially identified in a 1996 watershed analysis (USFS 1996) as one of the factors influencing water quality and fish habitat. Sites have compacted soil, user-created trails with increased erosion, streambank erosion, increased stream sedimentation, vegetation trampling and loss, tree damage and mortality, vandalism, litter, and human waste accumulation. The existing condition of each recreation site with respect to hydrology and soil resources is described, and site ratings for each measure are included in Table 9. Several recreation sites represented in Table 9 are not currently used as recreation sites, but will become sites in the proposed action and/or alternatives 1 and 2. In these cases, existing condition is discussed in terms of potential hydrologic suitability for a campsite. The restoration plans for the proposed action and alternative (Appendices A and C, respectively) include photographs of each site and a detailed description of existing site condition.

Table 9. Existing condition of Sullivan Creek recreation sites

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
1	n/a	Entire site is compacted, with	3	2	3	8

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
		denuded, eroding streambanks, user-created trails, and mining impacts. No understory vegetation or functional riparian area.				
2A, 2B, and 3	Moon Flat sites 1 a-f	Sanitation issues, generally sites is of low concern to riparian habitat and watershed function. Several unstable un-needed footpaths to Sullivan Creek are compacted and eroding.	1	1	2	4
DRS-4	Moon Flat 2		2	1	2	5
5	Sullivan Creek 1		1	1	3	5
6	n/a	Previous restoration treatments at site have mitigated potential hydrologic issues.	1	2	2	5
7	Sullivan Creek 2	Site is compacted with user-created trails to Sullivan Creek. Evidence of mining impacts at the site—excavated undercut streambanks and constructed pools.	1	1	3	5
8	Sullivan Creek 3	No hydrologic or soils concerns.	1	1	1	3
9	n/a	Compacted soils in site. Access road crosses relic channel. Access trails are compacted and eroding.	1	3	3	7
10	n/a	Severe soil compaction and tree damage. Located on an actively eroding outer bend of Sullivan Creek, which may be exacerbated by mining. Relic channels are located within the existing site. OHV use is evident in the campsite. Soil compaction, bank condition, and other resource damage indicate that closure is	3	3	3	9

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
		the best option for mitigation of resource concerns at this site.				
11	Sullivan Creek 4	Mining impacts along the bank and additional impacts from campers entering the creek at multiple locations. Nice bar where people can spend time on the Creek with little impact, but too many existing paths. Soils are compacted throughout the site, and sanitation issues are evident.	3	3	3	9
12	Sullivan Creek 5	Site is entirely in the floodplain. Tree damage, compacted soils, and sanitation issues throughout the site. Several relic channels throughout the site. Site is located on an outer meander bend. Stream restoration is planned for the reach adjacent to this site.	3	3	3	9
13	Sullivan Creek 6	Compacted soils throughout. Portions of the site are within the active floodplain—relict stream channels evident in the site.	2	3	3	8
14	Sullivan Creek 7a-f	No hydrologic concerns. Site is on opposite side of road from Sullivan Creek and is a desirable location for a site. Restroom makes this an appropriate location for additional sites.	1	1	1	3
15	Sullivan Creek 8	No hydrologic concerns. Site is on opposite side of road from Sullivan Creek and is a desirable location for a site.	1	1	1	3
16	Sullivan Creek 9	No hydrologic concerns. Site is on opposite side of road from Sullivan Creek and is a desirable location for a site.	1	1	1	3

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
17	Sullivan Creek 10	Large uncontained site with soil compaction located in a relic side channel that could easily be reactivated through stream restoration measures. Side channel could provide high restoration benefit through re-activation as a perennial side channel.	3	3	3	9
18	n/a	Site is currently closed, and will remain closed to overnight camping. Site is located in close proximity to Sullivan Creek, and this is an appropriate treatment to preserve hydrologic stability.	2	2	2	6
19	n/a	Site is in close proximity to the creek. Worn, eroded paths to weirs appear to have been excavated for mining.	3	3	2	8
20	Sullivan Creek 11	No hydrologic concerns. Site is on opposite side of road from Sullivan Creek and is a desirable location for a site.	1	1	2	4
21	n/a	Soil at the site within the floodplain is compacted. Access trails are eroding and compacted. Sanitation issues are evident. Site closure is the recommended treatment to mitigate hydrologic impacts.	3	3	3	9
21A	Sullivan Creek 12	Site is located across the road from Sullivan Creek and is an appropriate location for a site.	1	1	1	3
22	n/a	Site is compacted, eroding, and located within close proximity to Sullivan Creek.	3	3	2	8
23	Sullivan Creek 13	Large, expanding site. Hydrologic concerns are minimal—site is	1	1	2	4

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
		appropriate distance from Sullivan Creek.				
24	n/a	Located within close proximity to Sullivan Creek. Access points are eroding. Weirs create access points to Creek	1	3	3	7
25	Sullivan Creek 14	Compacted soils with tree damage and exposed roots. User-created trails are eroding into Sullivan Creek.	3	2	3	8
26	n/a	Site is located on an active channel meander, recently made more active by a log jam. Erosion site along Sullivan Creek Road located 100ft upstream of site could undermine road. Soil is compacted throughout the site. Site may be prone to periodic flooding and is located in the riparian habitat conservation area of an unnamed tributary of Sullivan Creek.	3	3	3	9
27	Sullivan Creek 15	Site is located across the road from Sullivan Creek and is an appropriate location for a site.	1	1	2	4
28	n/a	Site is located on an active outer bend of Sullivan Creek with a log jam. An 18-inch culvert drains through the site. Site is located in the floodplain, and is subject to periodic flooding.	3	3	3	9
28A	Sullivan Creek 16	No hydrologic concerns.	1	1	1	3
29	Sullivan Creek 17	Site is located within close proximity to Sullivan Creek, but is of minimal risk to Sullivan Creek. Trees provide	1	3	3	7

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
		stability between the site and Sullivan Creek, and along with the steepness of the bank discourage foot access to the Creek.				
30	n/a	Trail to stream is steep and may cause erosion.	1	2	2	5
31	Sullivan Creek 18	Site is expansive with little understory vegetation and compacted soils. Site condition on upper terrace is acceptable.	3	3	3	9
32	n/a	Site has compacted soils and little understory vegetation. Numerous redundant foot trails are eroding into Sullivan Creek.	1	1	2	4
33	Sullivan Creek 19	Compacted soils and lack of understory vegetation. Lowest portion of the site is located on the floodplain and has compacted soil.	1	2	2	5
34	Sullivan Creek 20	Site is located within close proximity to an active side channel of Sullivan Creek. Road to the site is muddy, eroding, and hydrologically connected to Sullivan Creek.	3	3	3	9
35	Sullivan Creek 21a	Large site is located within close proximity to an active side channel of Sullivan Creek. Road to the site is muddy, eroding, and hydrologically connected to Sullivan Creek. Soil is compacted, and banks are eroding.	2	1	2	5
36, 36A	Sullivan Creek 21b and c	Low hydrologic risk	1	1	1	3

DRS-site number	Final site number (s)	Existing Condition	Riparian Area Risk Rating	Floodplain Function Rating	Soil Compaction and Potential Erosion Rating	Total Rating
36B	Sullivan Creek 22	Low hydrologic risk	1	1	1	3
37 and 38	Sullivan Creek 23a-c	Camping area adjacent to Sullivan Creek has a user-created trail that is eroded and compacted. There is a lack of riparian vegetation at this site.	2	2	1	5
Total			**70**	**76**	**86**	**232**

Composite resource indicator and measure ratings are shown in Table 10.

Table 10. Resource indicators and measures for the existing condition and the no action alternative.

Resource Element	Resource Indicator	Measure	Existing Condition Composite Rating
Water quality, riparian function, and channel stability	Sediment delivery Riparian area condition	Riparian area condition rating	70
	Sanitation	Number of campsites with restroom access	13*
	Temperature	Potential improvement of processes expected to improve stream temperature	No improvement
Floodplain function	Floodplain connectivity	Floodplain function rating	76
Soil Stability	Soil Erosion and compaction	Soil compaction and potential erosion rating	86

*Total number rather than composite rating

Riparian Area Condition

The total composite score for the riparian area condition measure is 70 out of a possible 117 (which represents the least functional riparian condition possible using this rating system). Riparian area condition and function is low (rating of 3) at DRSs 1, 10, 11, 12, 17, 19, 21, 22, 25, 26, 28, 31, and 34. These sites are either lacking in riparian vegetation, or do not provide adequate buffering or filtration of sediment and other pollutants. Riparian areas within these sites generally do not provide effective shade to Sullivan Creek.

Restroom Access

There are four CXT restrooms located within or near the campsites along Sullivan Creek. Approximately 13 campsites are located within close proximity to a restroom.

Temperature

Sullivan Creek is included in the Colville National Forest TMDL based on exceedance of the 7-day mean daily maximum temperature of 12°C in 2008 and 2010. Data collected by Seattle City Light at seven sites in Sullivan Creek upstream from the Outlet Creek confluence from 2012 to 2016 indicate temperatures exceeding the 7-day mean daily maximum temperature of 12°C at all sites for all years sampled (Seattle City Light, 2017).

Floodplain Function

The total composite score for the floodplain function measure is 76 out of a possible 117 (which represents the highest impact of recreation sites in the floodplain, i.e. each site is located in a floodplain). Floodplain function is highest at DRSs 9, 10, 11, 12, 13, 17, 19, 21, 22, 24, 26, 28, 29, 31, and 34. Seventy-five to 100% of these sites are located within the floodplain of Sullivan Creek.

Soil Compaction and Potential Erosion

The total composite score for the soil compaction and potential erosion measure is 86 out of a possible 117 (which represents high soil compaction and potential erosion at all sites). Soil compaction and erosion potential is highest at DRSs 1, 5, 7, 9, 10, 11, 12, 13, 17, 21, 24, 25, 26, 28, 29, 31, and 34. These sites are generally the largest sites along Sullivan Creek and have large areas with bare compacted soils. These sites are expanding with increased use.

Environmental Consequences

Resource indicators and measures by alternative are summarized in Table 11 at the end of the effects analysis section.

No Action Alternative - Direct and Indirect Effects

Under the no action alternative, most recreation sites could continue to expand. Riparian area condition at many sites would continue to deteriorate without treatment. Recreation sites in the floodplain would remain and could extend further into the floodplain. Areas of compacted soils would continue to expand out from existing sites, and erosion risk would likely increase. Sanitation issues would likely continue; there would be no additional restrooms installed, and 13 out of 43 total sites are within close proximity to a restroom.

Potential continued expansion of recreation sites onto the floodplain and streambanks of Sullivan Creek could further impact riparian and floodplain vegetation. Decreases in riparian and floodplain vegetation could decrease shade and slightly increase temperatures in Sullivan Creek.

Proposed Action Alternative - Direct and Indirect Effects

The proposed action includes rehabilitation and closure of sites to improve bank erosion, decrease soil compaction, and rehabilitate riparian vegetation. The proposed action also creates several new sites out of the Sullivan Creek floodplain near restrooms. See Appendices A and B for a detailed description of the proposed action.

Riparian Area Condition and Water Quality

Direct Effects

Total composite score for the riparian area condition is 42, which is a 40% decrease in this metric from existing condition. This indicates that riparian area condition is expected to improve an

estimated 40% over existing condition through treatments in the proposed action. Sites with impacts to riparian vegetation would be re-vegetated with native riparian vegetation. Delineation of site footprint would keep impacts from recreational uses out of riparian areas. See Appendices A and B for a detailed description of the proposed action for each site. Riparian area condition ratings are expected to improve at DRSs 1, 4, 10, 11, 12, 17, 18, 19, 21, 22, 25, 26, 28, 31, 34, 35, 37, and 38. All recreation sites that received a rating of 3 for riparian area condition have an improved rating of 2 or 1 under the proposed action.

The proposed action would add one CXT restroom at the Moon Flat campsites. Under the proposed action, there would be five restrooms located within or near the campsites along Sullivan Creek. Approximately 20 campsites would be located within close proximity to a restroom under the proposed action compared 13 campsites in the no action.

Indirect Effects

An indirect effect of the proposed action on riparian area condition is a more functional and natural riparian ecosystem at treatment sites. Once soil is decompacted and riparian vegetation is established, stream shade would increase, and erosion and sedimentation would decrease. Increased shade and decreased erosion is expected to improve water quality, including dissolved oxygen and temperature and move conditions toward attainment of the Colville National Forest TMDL and WQIP.

Increasing the number of campsites with restroom access is expected to improve sanitation at these sites, resulting in a potential improvement in water quality, including fecal coliform.

Fees collected would allow increased management of site use, which would reduce potential impacts to riparian and floodplain vegetation.

Floodplain Function

Direct Effects

Total composite score for the floodplain function is 44. This indicates that floodplain function would improve an estimated 41% over existing condition through the proposed action. Floodplain function ratings are expected to improve at DRSs 6, 9, 10, 11, 12, 13, 18, 19, 21, 22, 24, 26, 28, 29, 30, 31, 33, and 34. Treatments to move recreation site footprints outside the floodplain are expected to improve this score at all sites with a rating of 3 for floodplain function with the exception of DRS-17. Following treatment in the proposed action, DRS-17 remains a high risk due to its location of the floodplain of Sullivan Creek.

Indirect Effects

Indirect effects of the proposed action include improvement of floodplain function in Sullivan Creek adjacent to the Sullivan recreation sites. As floodplains are reconnected to the main channel of Sullivan Creek, they would be more frequently recharged during flood flows. This frequent recharge is expected to encourage riparian vegetation growth and improve riparian and aquatic habitat.

Soil Compaction and Potential Erosion

Direct Effects

Total soil compaction and potential erosion composite score is 45, which is a 47% decrease in this metric from existing condition and the no action alternative. Soil compaction is inherent in campsites that receive concentrated use; however, the proposed action reduces soil compaction at nearly all sites, through creation of a smaller campsite footprints. Soil compaction and potential

erosion ratings are expected to improve at DRSs 1, 2A, 2B, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, and 35. All sites that received a 3 rating for existing condition would be improved under the proposed action. Soil scarification and planting in previously compacted soils would restore soil productivity and reduce potential erosion.

Indirect Effects

Treatments to decrease soil compaction and overall site footprints across Sullivan Creek Recreation Sites would improve soil productivity and improve long-term vegetation function in treated riparian areas, floodplains, and upland sites.

Cumulative Effects

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Understanding watershed history (i.e., past management activities, hydrologic events, wildfire) is important to build a temporal context of past impacts, current condition and potential future effects. Analysis of watershed history is essential to help predict effects of future management activities on water quality and watershed condition. A variety of past, present, and reasonably foreseeable projects have occurred, are occurring, or are planned to occur within the hydrologic analysis area for the Sullivan Creek Recreation Sites project. Past activities include timber harvest, road and trail building and maintenance, construction of weirs in Sullivan Creek and its tributaries, wildland fire, landslide stabilization on the Sullivan Creek Road, installation of a coldwater pipe to decrease temperatures in Outlet Creek, replacement of culverts on Wasson and Kinyon Creeks, removal of a log step on Rainy Creek, removal of a culvert on John's Creek, and removal of Mill Pond Dam. Ongoing activities include dispersed and designated recreation, suction dredge and placer mining in Sullivan Creek and tributaries, brook trout suppression activities, and road and trail maintenance. Reasonably foreseeable projects include stream restoration and wood placement in 8 reaches of Sullivan Creek upstream of Mill Pond and 1 reach of Wasson Creek, brook trout suppression in Highline Creek, restoration of the Mill Pond reach of Sullivan Creek, several landslide stabilizations along Sullivan Creek near Mill Pond, wood placement and stream restoration downstream of Mill Pond Dam, and reconstruction of the Sullivan Creek Road. These projects are expected to result in short-term, localized potential increases in erosion and sedimentation, but will result in long-term improvements in aquatic function and water quality.

The Noisy Fire burned in the Headwaters Sullivan Creek subwatershed in 2017. The fire burned at moderate to low severity through several of the Sullivan Creek recreation sites, and burned along approximately 1 mile of the eastern bank of Sullivan Creek. The Noisy Fire burned at low to moderate severity along Sullivan Creek, and is expected to result in slight localized increases in erosion and sedimentation over the next couple of years. Wood inputs into Sullivan Creek are also expected to increase in this timeframe.

The proposed action when combined with past, present, and reasonably foreseeable projects in the hydrology analysis area is expected to improve all resource indicators because treatments in the proposed action (and the majority of projects occurring in the watershed) would improve conditions along Sullivan Creek, resulting a more resilient conditions.

Alternative 1 - Direct and Indirect Effects

Alternative 1 includes rehabilitation, closure, of recreation sites impacting streams and riparian areas to reduce bank erosion, decrease soil compaction, and rehabilitate riparian vegetation. Alternative 1 increases the number of sites outside of the Sullivan Creek floodplain, and near CXT restrooms. Appendices C and D of this EA provide a detailed description of alternative 1.

Riparian Area Condition

Direct and Indirect Effects

Total composite score for the riparian area condition measure is 41, which is a 40% decrease in this metric from existing condition. Potential direct and indirect effects are similar to the proposed action, however closure of DRS-17 (that would remain open under the proposed action) to facilitate a future stream restoration project (Seattle City Light 2017a and 2017b) would improve riparian condition, water quality, and stream temperature more effectively than the proposed action.

Increasing the number of campsites with restroom access from 20 in the proposed action to 28 in alternative 1 is expected to improve sanitation at these sites more effectively than the proposed action, resulting in potential improvement in water quality, including fecal coliform.

Floodplain Function

Total composite score for the floodplain function is 42, which is 41% decrease in this metric from existing condition. This indicates that floodplain function would be improved an estimated 41% over existing condition under alternative 1. Potential direct and indirect effects are similar to the proposed action; however, additional treatment at DRS-17 would improve riparian condition more effectively in alternative 1 than the proposed action. Closure of DRS-17 within the floodplain of Sullivan Creek presents an opportunity to increase floodplain connectivity and channel complexity through the reengagement of the relict side channel within the site (Seattle City Light 2017(b)).

Soil Compaction and Potential Erosion

Total soil compaction and potential erosion composite score is 43, which is 47% decrease in this metric from existing condition. This indicates that soil compaction and potential erosion would be improved an estimated 47% over existing condition. Soil compaction is inherent in campsites that receive concentrated use, however, alternative 1 reduces soil compaction at all sites, through creation of a smaller footprint. Soil scarification and planting in previously compacted soils would restore soil productivity and reduce potential erosion.

Cumulative Effects

Similar to the proposed action, alternative 1, when combined with past, present, and reasonably foreseeable projects in the hydrology analysis area is expected to improve all resource indicators because treatments in the proposed action (and the majority of projects occurring in the watershed) would improve conditions along Sullivan Creek, resulting a more resilient conditions.

Alternative 2 - Direct and Indirect Effects

Alternative 2 was developed to improve watershed and aquatic function and native fish habitat in Sullivan Creek, and would close most recreation sites adjacent to Sullivan Creek. Alternative 2 would allow camping at sites outside the Sullivan Creek floodplain (generally across the Sullivan Creek Road from Sullivan Creek) and within close proximity to a restroom facility. Day use sites

outside the floodplain would also remain open. All other sites would be closed and rehabilitated to minimize resource impacts to soil, water, fisheries, and riparian areas.

Sites remaining open (within close proximity to a restroom, and outside the Sullivan Creek floodplain) would follow site designs proposed in alternative 1. Alternative 2 would provide a sustainable recreation experience at sites kept open, however recreation opportunities would be more limited than in all other alternatives. Alternative 2 is described in greater detail in Chapter 2 of the environmental assessment.

Riparian Area Condition

Direct and Indirect Effects

Total composite score for the riparian area condition measure is 39, which is a 44% decrease in this metric from existing condition. This is a 4% improvement over alternative 1. Potential direct and indirect effects are similar to alternative 1; however, additional site closures along Sullivan Creek would improve riparian condition more effectively than alternative 1. While the number of sites closed increases in alternative 2, the modest 4% potential improvement in the riparian area condition measure over alternative 1 indicates that proposed rehabilitation measures at sites adjacent to Sullivan Creek in alternative 1 are expected to effectively improve riparian area condition without additional site closures proposed in alternative 2.

The number of campsites with restroom access is the same in alternative 2 as alternative 1; however, there are fewer recreation sites without restroom access in alternative 2 than in all other alternatives. Alternative 2 would result in the greatest potential improvement in water quality and fecal coliform of all alternatives.

Floodplain Function

Total composite score for the floodplain function is 39, which is a 49% decrease in this metric from existing condition. This indicates that floodplain function would be improved an estimated 49% over existing condition under alternative 1 which is 8% greater than what could be expected in alternative 1. Potential direct and indirect effects are similar to the proposed action, and alternative 1, however closure of an additional sites along Sullivan Creek would potentially increase floodplain connectivity and channel complexity at sites near or within the floodplain.

Soil Compaction and Potential Erosion

Total soil compaction and potential erosion composite score is 39, which is a 55% decrease in this metric from existing condition. This indicates that soil compaction and potential erosion would be improved an estimated 55% over existing condition in alternative 2. This is an 8% improvement over alternative 1. Alternative 2 would reduce soil compaction to a near-natural condition at all sites that would be closed and rehabilitated. Soil scarification and planting in previously compacted soils will restore soil productivity and reduce potential erosion.

Cumulative Effects

Similar to the proposed action and alternative 1, alternative 2, when combined with past, present, and reasonably foreseeable projects in the hydrology analysis area is expected to improve all resource indicators because treatments in the proposed action (and the majority of projects occurring in the watershed) would improve conditions along Sullivan Creek, resulting a more resilient conditions.

Summary of Environmental Effects

This section analyzed potential effects of the no action and three action alternatives on water quality, riparian function, channel stability, floodplain function, and soil stability, which are summarized in Table 11. Based on composite ratings for each metric, all action alternatives of the Sullivan Creek Recreation Sites project are expected to improve water quality, riparian function, channel stability, floodplain function, and soil stability, measured through ratings and analysis of riparian condition, sanitation, water quality, floodplain function, soil compaction, and potential erosion. The proposed action would improve riparian area condition at recreation sites along Sullivan Creek, improve floodplain connectivity, and reduce soil compaction and potential erosion. Alternative 1 would be slightly more effective in improving riparian area condition, water quality, floodplain connectivity and reducing soil compaction and erosion potential than the proposed action. Alternative 2 is the most effective alternative to improve riparian area condition, water quality, floodplain connectivity, reduction in soil compaction and erosion potential than the no action, proposed action, and alternative 1 (Table 11).

Table 11. Summary comparison of how the alternatives address the purpose and need (with the exception of temperature, lower ratings indicate better condition)

Resource Element	Resource Indicator	Measure	No Action Composite Rating	Proposed Action Composite Rating	Alternative 1 Composite Rating	Alternative 2 Composite Rating
Water quality, riparian function, and channel stability	Sediment delivery Riparian area condition	Riparian area condition rating	70	42	41	39
	Sanitation	Number of campsites with restroom access	*13	*20	*28	*28
	Temperature	Potential improvement of processes expected to improve stream temperature	No improvement	Moderate-high improvement	High improvement	Highest improvement
Floodplain function	Floodplain connectivity	Floodplain function rating	76	44	42	39
Soil Stability	Soil Erosion and compaction	Soil compaction and potential erosion rating	86	45	43	39

*Absolute number rather than composite rating.

Wildlife and Fisheries

This section incorporates by reference the biological assessment (BA) for Forest Service sensitive species, management indicator species and migratory birds (Lawson 2017a), and the BA for threatened, endangered, or proposed species (Lawson 2017b). This section evaluates existing condition, suitable habitat evaluation, and determination of potential effects for Threatened, Endangered, Forest Service Sensitive, and Forest Service Management Indictor Species for fish and wildlife species. The Hydrology section of this report discusses fish habitat and evaluates how the projects preserves or improves INFISH Riparian Management Objectives and other fish habitat measures.

Analysis area

Based on the geographic extent of anticipated project impacts, the analysis area for the project includes the project footprint and terrestrial habitat extending within a 0.5-mile radius around each DRS. This represents a conservative estimate of the area where increased noise and human presence during construction may be elevated above baseline noise levels based on the proposed construction activities.

Federally Threatened, Endangered, or Sensitive Species

Both the National Marine Fisheries Service (NMFS) and USFWS provide listings of threatened and endangered species under their jurisdiction. Of these species, those listed in Table 12 could potentially occur within or near the project area. No anadromous salmon under the purview of NMFS are present within Sullivan Creek, as dams downstream of the Boundary Hydroelectric block fish passage to the project area. The project specific USFWS species list for Pend Oreille County indicates that one fish species and five wildlife species are potentially present in the project area.

The potential presence of listed species within the project area was further evaluated by reviewing Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) data (WDFW 2014a), the Salmonscape database (WDFW, 2014b), and the WDFW Stock Inventory Data (WDF and WWTIT, 1994; WDFW 1998, 2004, 2006). The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with National Marine Fisheries Service (NMFS) on activities that may adversely affect Essential Fish Habitat (EFH). No EFH is present within the project area; therefore, EFH will not be addressed further in this document.

This project is covered under an existing Biological Opinion (BiOp) prepared by the United States Fish and Wildlife Service (USFWS) for the Federal Energy Regulatory Commission (FERC) relicensing of Boundary Dam and surrender of the Sullivan Creek Project license (USFWS, 2012) (see Table 12 for 2012 effects determination). However, detailed elements on how the project would be implemented were not available at the time the USFWS developed the 2012 BiOp; thus, additional analysis regarding these details is included in this document (specifically, the number and type of recreation sites affected and the specific restoration actions proposed). In addition, since the 2012 BiOp was issued, one species potentially present in the project vicinity, yellow-billed cuckoo, was listed as threatened under the ESA. A second species potentially present in the Analysis area, North American wolverine, has also been proposed for listing as threatened under ESA, since the BiOp was issued.

Table 12. Federally Threatened, Endangered, and Proposed Species as of May 2016 potentially present within the project vicinity.

Species Name (Scientific Name)	ESA Listing Status	Suitable Habitat Evaluation	USFWS 2012 BiOp Effects Determination	ESA Effects Determination and Rationale
Bull trout (*Salvelinus confluentus*)	Threatened	Suitable habitat for spawning, foraging, and migrating bull trout present in Sullivan Creek. Bull trout sub-populations are documented to utilize these areas within the Analysis area.	Likely to Adversely Affect	**No Effect** - Bull trout are extremely rare within Sullivan Creek; no spawning populations are present, and upstream passage is precluded to the majority of the analysis area. Project does not include in-water work and would not cause sedimentation or degrade or water quality
Yellow-Billed Cuckoo (*Coccyzus americanus*)	Threatened	No suitable habitat (large blocks of riparian cottonwood forest) within the Analysis area.	Species Was Not Yet Listed	**No Effect** - Cuckoo is extremely rare in Washington State. Analysis area does not include suitable habitat.
Canada Lynx (*Lynx canadensis*)	Threatened	Suitable habitat (suitable den habitat within proximity to some campsites where heavy equipment would be operated) within Analysis area, but no high quality foraging, denning, or security habitats within project sites.	May Affect, Not Likely to Adversely Affect	**May Affect, Not Likely to Adversely Affect -** The project area is outside the primary range of lynx (above 4,000 feet). The majority of work would be completed outside the lynx denning period and no extremely loud construction activities (e.g., blasting, helicopter use) or net increases in road or site use are planned.
Grizzly Bear (*Ursus arctos horribilis*)	Threatened	Suitable habitat within Analysis area, but no high high-quality foraging or security habitats within project sites.	May Affect, Not Likely to Adversely Affect	**May Affect, Not Likely to Adversely Affect** - The project is located adjacent to the Selkirk Mountains Grizzly Bear Recovery Area. The project is located within the Sullivan Creek corridor, which is a relatively high human use area where grizzlies are prone to human disturbance. Summer construction and no extremely loud construction activities (e.g., blasting, helicopter use) or net increases in road or site use. In addition, ground-based project activities would be within close proximity to the Sullivan Creek Road.

Species Name (Scientific Name)	ESA Listing Status	Suitable Habitat Evaluation	USFWS 2012 BiOp Effects Determination	ESA Effects Determination and Rationale
Woodland Caribou (*Rangifer tarandus caribou*)	Endangered	Suitable habitat (early winter habitat consisting of late and old cedar / hemlock forest stands) exists adjacent to some of the campsites within the Analysis area, but no high quality foraging, calving, or security habitats within project sites.	May Affect, Not Likely to Adversely Affect	**May Affect, Not Likely to Adversely Affect –** The center of activity of the South Selkirk Mountains caribou herd is in the vicinity of Stagleap Provincial Park in British Columbia. Caribou from this remnant population occasionally cross the border into Washington, but they have not been documented outside the Salmo-Priest Wilderness in recent years. The project would be located outside of designated critical habitat for caribou. In addition, Summer construction and no extremely loud construction activities (e.g., blasting, helicopter use) or net increases in road or site use.
North American Wolverine (*Gulo gulo luscus*)	Proposed Threatened	Suitable habitat within the Analysis area, but no high-quality foraging, denning, or security habitats within project sites.	Species Was Not Yet Proposed	**Will not jeopardize the continued existence -** Discountable chance of species occurrence within Analysis area. Summer construction and no extremely loud construction activities (e.g., blasting, helicopter use) or net increases in road or site use. Insignificant impacts from construction equipment use and minor clearing.

Colville National Forest Sensitive and Management Indicator Species

Management Framework for CNF Sensitive Species

The USFS maintains a list of sensitive species for each national forest. Sensitive species are those whose population viability is a concern because of:

- Significant current or predicted downward trends in numbers of animals, or
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Species recently de-listed under the Endangered Species Act (ESA) are currently classified as USFS sensitive to ensure that forest management activities do not lead to population decline and re-listing. Additional direction is provided by the Bald and Golden Eagle Protection Act.

CNF Sensitive Species

Tables 13 through 16 display information for terrestrial sensitive wildlife species, including mammals and invertebrates that could potentially occur in the project area. Potential effects of the project on those species with potential habitat in the project area (designated with shaded rows in the tables) are addressed in this BA.

Table 13. Sensitive Bird Species for the Colville National Forest as of July 13, 2015. Potential habitat for species in shaded rows occurs in the project area. Species in shaded rows are addressed in this analysis.

Sensitive Birds	Habitat Present?	Documented in the CNF?	Habitat Description / Other Comments
American Peregrine Falcon *(Falco peregrinus anatum)*	Yes	No	Foraging habitats include open marshes, river bottoms, and seacoasts that provide waterfowl, upland game birds, and larger passerine birds. Peregrines typically nest on a ledge of a tall (150 foot +), sheer cliff face (Hayes and Buchanan, 2001).
Bald Eagle *(Haliaeetus leucocephalus)*	Yes	Yes	Bald eagles forage on rivers and large lakes with abundant fish (e.g., Pend Oreille River). Eagles typically nest and perch in large trees that stand above the main forest canopy, and usually within 1 mile of a foraging area. Winter roosts may be in late successional stage stands with good overhead canopy (Stalmaster, 1987).
Common Loon *(gavia imner)*	No	No	Loons require large lakes or rivers with abundant fish and adequate shoreline vegetation to conceal a nest. Seclusion from human disturbance is critical to nesting loons (Richardson et al., 2000).
Great Gray Owl *(Strix nebulosa)*	No	No	This owl forages in open, grassy habitat including open forest stands, selective and clear-cut logged areas, meadows, and wetlands. They nest in large, broken-topped snags or abandoned raptor nests in forest stands near lakes, wet meadows, and pastures (Hayward and Verner, 1994). Nesting has not been confirmed on the CNF.
Harlequin Duck (*Histrionicus histrionicus*)	Yes	Yes	Harlequin ducks breed on cold, fast-moving streams with dense shrub / timber nearby and an absence of human disturbance (Lewis and Kraege, 2003). On the CNF, they have been known to nest on Sullivan, Outlet, and Harvey creeks. They winter on boulder-strewn sea coasts.
Lewis's Woodpecker *(Melanerpes lewis)*	No	No	This woodpecker is principally associated with open or park-like ponderosa pine stands and cottonwood riparian areas. They also nest in burned-over stands of Douglas fir, mixed conifers, and riparian woodlands. Brushy undergrowth is an important component of foraging and breeding habitat (WDFW, 1991).
Northern Goshawk	Yes	Yes	Goshawks are wide-ranging forest raptors that use a variety of forest types for nesting

Sensitive Birds	Habitat Present?	Documented in the CNF?	Habitat Description / Other Comments
(Accipiter gentilis)			and foraging. They tend to select stands with high canopy closure, larger trees, and gentle to moderate slopes for nesting. Where forest habitats are continuous, the spacing between active nests is fairly regular (Woodbridge and Hargis, 2006). Goshawks are ambush hunters known for their agility and relentlessness in pursuit of prey. Prey items include forest grouse, hares, tree and ground squirrels, woodpeckers, and larger passerine birds.
Sandhill Crane *(Grus canadensis)*	No	No	Sandhill cranes are associated with large tracts of undisturbed marshes or meadows. For nesting, they require isolated sites with good cover more than ¼ mile from roads (Littlefield and Ivey, 2001). Individual birds are occasionally seen on the CNF, but not in the Analysis area, and nesting has not been confirmed.
White-headed Woodpecker *(Picoides albolarvatus)*	No	No	Primarily birds of mature, ponderosa pine forests. This species forages on large, decayed snags and ponderosa pine trees greater than 24 inches in diameter (WDFW, 1991). It is most likely to be found in the dry site stands of the west side of the CNF (Ferry County).

Table 14. Sensitive Mammal Species for the Colville National Forest as of July 13, 2015. Potential habitat for species in shaded rows occurs in the project area. Species in shaded rows are addressed in this analysis.

Sensitive Mammals	Habitat Present?	Documented in the Project Area?	Habitat Description / Other Comments
Gray Wolf *(Canis lupus)*	Yes	Yes, Salmo Pack	Gray wolves are closely tied to habitats that support prey animals (usually big game). Wolves often den on moderately steep slopes on south aspects within 400 feet of water. Rendezvous sites include wetlands or small meadows with dense vegetation nearby (Mech, 1991). Wolf packs are widespread on the CNF.
Pygmy Shrew *(Sorex hoyi)*	Yes	No	Found in conifer stands with dense ground vegetation. May be associated with disturbed, seral habitats. In WA, pygmy shrews have been captured in upland, even-aged second-growth conifer forests (WDFW, 1991; Gervais, 2015a).
Red-tailed Chipmunk *(Tamias ruficaudus)*	Yes	No	On the CNF, this species is most prevalent at higher elevations in the moist, Engelmann spruce / subalpine fir plant associations where stand understories are dense. Openings and forest edges are important habitat features. Conifer seeds are a major

Sensitive Mammals	Habitat Present?	Documented in the Project Area?	Habitat Description / Other Comments
			food source, but the leaves, fruit, and seeds of shrubs and herbs are also important (Best, 1993; Gervais, 2015b).
Townsend's Big-eared Bat *(Corynorhinus townsendii)*	Yes	Yes	This bat hibernates in caves or mine adits (tunnels) that are generally close to freezing. Nursery colonies are typically in sites above 50 degrees F; often in old abandoned buildings. Townsend's bats roost in caves, mine adits, old buildings, and the undersides of bridges (WDFW, 1991). Prey items are mostly flying insects (primarily moths) caught near and among foliage (Hayes and Wiles, 2013).
Little Brown Bat (*Myotis lucifugus*)	Yes	Yes	This bat is found in a variety of forest habitats at elevations up to tree line. They prefer riparian areas and sites with open water. Roost sites include buildings and bridges, tree cavities, beneath tree bark, rock crevices, caves, and mines (Hayes and Wiles, 2013). They forage for aquatic insects over water and on a variety of insects over forest trails, cliff faces, meadows, and farmland.

Table 15. Sensitive Invertebrate Species for the Colville National Forest as of July 13, 2015. Potential habitat for species in shaded rows occurs in the project area. Species in shaded rows are addressed in this analysis.

Sensitive Invertebrates	Habitat Present?	Documented in the Area?	Habitat Description / Other Comments
Butterflies & Moths			
Eastern Tailed Blue *(Cupido comyntas)*	No	No	This species has adapted well to human activity and thrives in disturbed environments. It uses a variety of lightly wooded, dry habitats and weedy areas. It is found in vacant lots, parks, canals, and creeks and fallow fields. Caterpillars feed on both native and exotic plants in the pea family.
Meadow Fritillary (*Boloria bellona*)	No	No	Common in the eastern U.S. in hayfields and human-disturbed habitats. In the west they occur in meadows and openings in aspen or pine forests.
Peck's skipper *(Polites peckius)*	Yes	No	In the Pacific Northwest, habitats include mountain meadows, marshy edges of potholes, and roadsides. Wet, grassy meadows are preferred.
Rosner's Hairstreak (*Callophyrus nelsoni rosneri*)	Yes	No	Habitat for this species includes openings and edges in coniferous forest around western red cedar.

Sensitive Invertebrates	Habitat Present?	Documented in the Area?	Habitat Description / Other Comments
Tawny-edged Skipper (Polites themistocles)	No	No	Mid to low elevation grasslands.
Dragonflies & Damselflies			***(Foltz, 2008; Foltz-Jordan, 2011; Paulson, 1999)***
Subarctic Bluet (*Coenagrion interrogatum*)	No	No	Populations of these species are localized and rare in the Pacific Northwest. In Washington, they are associated with high-elevation ponds, bogs, fens, and boreal wetlands. On the CNF, they have been documented at Bunchgrass, Rufus, Granite, Davis, and Little Davis meadows. Subarctic bluet has also been found at Frater Lake, a mid-elevation lake / wetland complex influenced by cold air drainage (Loggers and Moore, 2011).
Subarctic Darner (*Aeshna subarctica*)	No	No	
Zigzag Darner (*Aeshna sitchensis*)	No	No	
Delicate Emerald (*Somatochlora franklini*)	No	No	In Washington, both species have been found only at Bunchgrass Meadows, a Research Natural Area on the CNF (Loggers and Moore, 2011). Bunchgrass Meadows is an extensive, high elevation, sedge wetland. It is similar to boreal bogs located much farther north in Canada and is thought to be a remnant of the last ice age.
Whitehouse Emerald (*Somatochlora whitehousei*)	No	No	
Bees			***(Jepson, 2013)***
Western Bumble Bee (*Bombus occidentalis*)	Yes	No	Bumble bees inhabit a variety of natural, agricultural, urban, and rural habitats. Species richness tends to peak in flower-rich meadows of forests and subalpine zones. Western bumble bees were once found throughout Oregon and Washington, but are now largely confined to high elevation sites and areas east of the Cascade Crest. Like other bumble bees, this species has three basic habitat requirements: suitable underground nesting sites for the colonies, nectar and pollen from floral resources available throughout the duration of the colony period (spring, summer, and fall), and suitable overwintering sites for the queens.
Mollusks			
Fir Pinwheel (*Radiodiscus abietum*)	Yes	No	Most often found in moist and rocky Douglas fir forest at mid-elevations in valleys and ravines and sometimes in western red cedar. It is often found in or near talus of a variety of rock types, or under fallen logs (Duncan, 2008).
Magnum Mantleslug (*Magnipelta mycophaga*)	Yes	No	This species prefers very moist habitats with permanent or persistent water sources. It is often associated with rock talus, deep leaf and needle duff, and large woody debris. In Washington, it is found in subalpine fir plant associations (Frest & Johannes, 1995).
Thinlip Tightcoil (*Pristilioma idahoense*)	Yes	No	This species generally prefers low elevation valleys, ravines, gorges, or talus sites near permanent or persistent water (Frest &

Sensitive Invertebrates	Habitat Present?	Documented in the Area?	Habitat Description / Other Comments
			Johannes in Foltz-Jordan, 2010). In Pend Oreille County, this species has been found in a variety of substrates, including under rotting pieces of wood, among moss-covered litter, and on the underside of poles in an old skid trail (Burke, in Foltz-Jordan, 2010).

Effects Analysis for Sensitive Species

Table 16. Summary of potential effects of the action alternatives on sensitive species

Sensitive Species	Effects Determination for the proposed action, and alternatives 1 and 2	Rationale for Determination
Harlequin Duck	Project may impact individuals but would be unlikely to cause a trend to federal listing	Some individual ducks, including fledglings, could be disturbed during work by construction equipment adjacent to Sullivan Creek; however, no in-water work would occur and the spatial extent of construction work at any given time is limited to small areas of the DRS. If work occurs during the nesting season (April 15 to July 30) construction during this time would occur at the recreation sites physically furthest to Sullivan Creek. If work occurs within the nesting season, and along streambanks, a USFS wildlife biologist will perform surveys to ensure no nests would be disturbed. In addition, all of the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic.
Northern Goshawk/ Bald Eagle	Project may impact individuals but would be unlikely to cause a trend to federal listing	Suitable nesting habitat and foraging habitat may occur in the project area; however, there are no known active or historic nests within the vicinity of the project work site. Noise and human activity from construction activities would be slightly elevated from background levels at the recreation sites and minor impacts to vegetation will be required, including removal of several trees at three recreation sites, as part of the project. However, the project will occur near the end of the nesting period and the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic. Any construction disturbance to these species would be minimal and no negative long-term effects to habitat would occur.
Gray Wolf	no impact	No known active den or rendezvous sites in the vicinity of the project area. Effects to big game (prey species) cover and forage habitats would be of such small scale as to be insignificant or discountable. The potential for the project to disturb and displace individual animals using the area would be similar to those previously reported for grizzly bears.

Sensitive Species	Effects Determination for the proposed action, and alternatives 1 and 2	Rationale for Determination
Pygmy Shrew and Red-tailed Chipmunk	Project may impact individuals but would be unlikely to cause a trend to federal listing	Likely rare in project area, although suitable habitat for both species is likely present at some project sites. Noise and human activity from construction activities would be slightly elevated from background levels at the recreation sites and minor impacts to vegetation will be required, including removal of several trees at three recreation sites, as part of the project. Some minor impacts may occur to individuals due to construction disturbance or habitat degradation from clearing.
Sensitive Bats	Project may impact individuals but would be unlikely to cause a trend to federal listing	There are no known caves, abandoned buildings or mines in the vicinity of any project work site. No blasting or increases in road or site use. However, these species occasionally roost in hollow trees or under peeling bark, and such habitat is present within the DRSs. Noise and human activity from construction activities would be slightly elevated from background levels at the recreation sites and minor impacts to vegetation will be required, including removal of several trees at three recreation sites, as part of the project. However, the project will occur near the end of the nesting period and the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic. Any construction disturbance to these species would be minimal and no negative long-term effects to habitat would occur. Furthermore, the project would not involve blasting or increase net recreation site use numbers. Snags within recreation sites could be reduced if they present a hazard to public safety; however, snag felling would be localized to recreation sites and would result in a minimal reduction of snags across the analysis area.
Sensitive Invertebrates	Project may impact individuals but would be unlikely to cause a trend to federal listing	These relatively rare species prefer moist conditions in a variety of rock types and talus, fallen logs, and subalpine fir plant associations. In most of the areas to be disturbed, the intent of the project goal is to reduce the extent of high-human use areas (compacted ground devoid or non-native vegetation). However, several sites contain downed logs and sub-alpine fir associations exist in the Gypsy Meadows area. Construction equipment could cause ground disturbance and could crush individual invertebrates. Also, minor impacts to vegetation will be required, including removal of several trees at three recreation sites, which could negatively affect suitable habitat on a small-scale.

CNF Management Indicator Species (MIS) List

Management Framework for CNF MIS

Rather than attempt to manage for each of the hundreds of wildlife species found on the CNF, the MIS approach identifies a few representative species for active management and conservation. Essential habitats provided for each indicator species would in turn support many other animals with similar habitat requirements. Indicator species listed for the CNF were selected for one or more of the following reasons:

- They are endangered or threatened with extinction.
- They are believed to be sensitive to the effects of forest management on a major biological community (such as old-growth forests).
- They require specialized habitats that could be sensitive to forest management practices.
- They are species commonly hunted, fished, or trapped.

Standards and guidelines for MIS habitat management are found on pages 4-38 to 4-42 of the Colville National Forest Land and Resource Management Plan (Forest Plan; USFS, 1988). These required measures were intended to ensure that forest management activities do not lead to the loss of viability of MIS populations across the Forest.

New research conducted since the Forest Plan went into effect has greatly improved our knowledge of the habitat requirements of forest wildlife in the Pacific Northwest. This has led to several Forest Plan amendments, which have updated how the USFS manages MIS habitats on the CNF and other national forests in the region. The Inland Native Fish Strategy (USFS, 1995) provided new direction for the management of riparian habitats to meet the needs of native fish. The Regional Forester's Forest Plan Amendment #2 (Lowe, 1995) provided direction for the management of old-growth associated species habitats, dead wood habitats, and northern goshawk habitat, in timber sale areas.

Youkey (2012) completed a comprehensive assessment of the status of MIS on the Colville National Forest. This assessment contains species-specific information including; general distribution, Washington State distribution, detailed habitat descriptions, home range sizes, threats / risk factors, conservation status, population trends, habitat modeling, and viability assessments for each MIS across the forest. This analysis of project effects to MIS is tiered to that report.

MIS Addressed with this Project

Table 17 displays the MIS listed for the CNF (USDA 1989). This analysis addresses the potential effects of the project on those species with potential habitat in the area where project work is proposed (shaded rows).

Table 17. Management Indicator Species for the CNF. Potential habitat for species in shaded rows occurs in the project area. Species in shaded rows are addressed in this analysis.

MIS Species	Habitat Present?	Documented in the Area?	Representative Habitats (USFS, 1988)	Habitat Modeling / Other Comments (Youkey, 2012; USFS, 1988)
Grizzly Bear *(Ursus arctos)*	Yes	Yes	"Seclusion" habitat within the recovery area.	Acres of core habitat (lands farther than 500 meters from open or restricted roads). Total and open road densities.

MIS Species	Habitat Present?	Documented in the Area?	Representative Habitats (USFS, 1988)	Habitat Modeling / Other Comments (Youkey, 2012; USFS, 1988)
Woodland Caribou *(Rangifer tarandus)*	Yes	Yes	Mature and old-growth stands in cedar / hemlock and subalpine fir / spruce cover types within the recovery area.	The overall quantity of habitat within the recovery area is not currently considered to be limiting to caribou.
Rocky Mtn. Elk *(Cervus canadensis)* Deer *(Odocoileus* spp.*)*	Yes	Yes	Low elevation winter ranges.	Approximately 201,527 acres of the CNF is designated big game winter range. Habitat objective is to provide a 50:50 cover to forage ratio with no point farther than 600 feet from forested cover.
Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)	Yes	Yes	Aquatic habitats (streams, rivers, and lakes).	
Beaver *(Castor canadensis)*	Yes	Yes	Aquatic and riparian habitats associated with low gradient streams, aspen, and willows.	Approximately 177,118 acres of habitat is well distributed across the CNF.
Northern Bog Lemming *(Synaptomys borealis)*	No	No	High elevation bogs.	In Pend Oreille County, this species is only known to occur in Bunchgrass Meadows, a large boreal fen more than 15 miles north of the project area.
Primary Cavity Excavators	Yes	Yes	Standing dead trees (snags).	Ponderosa pine, western larch, quaking aspen, and paper birch are the favored tree species in many localities (Bull et al., 1997). Large diameter snags are preferred for nesting / roosting. Densities of these trees have declined from historic levels across the CNF.
Pine Marten *(Martes americana)*	Yes	Yes	Mature and old-growth mesic conifer habitat, and down trees at moderate to high elevations.	Approximately 12,252 acres of habitat is well distributed on only a portion of the CNF. Declines in source habitats from historic levels have been extensive in the region.
Barred Owl *(Strix varia)*	Yes	Yes	Lower elevation mature and old-growth forest.	Approximately 93,081 acres of habitat is well distributed across the CNF.
Pileated Woodpecker *(Dryocopus pileatus)*	Yes	Yes	Mature and old-growth forest in Douglas fir or cedar / hemlock cover types, and large snags and logs.	Approximately 93,081 acres of habitat distributed across the CNF. Populations and source habitat are likely less abundant than historic conditions. Densities of large-diameter snags have declined from historic levels across the CNF.

MIS Species	Habitat Present?	Documented in the Area?	Representative Habitats (USFS, 1988)	Habitat Modeling / Other Comments (Youkey, 2012; USFS, 1988)
Northern Three-toed Woodpecker *(Picoides tridactylus)*	Yes	Suspected	Mature lodgepole pine and subalpine fir forest stands.	Approximately 518,864 acres of habitat distributed across the CNF. Populations and habitat are widely distributed, but highly dispersed with areas exhibiting lower abundance.
Dusky (Blue) Grouse *(Dendragapus obscurus)*	Yes	Suspected	Winter habitat - mature trees along ridgetops, nesting habitat - open forest with grass/shrub understory at lower elevations.	Approximately 36,145 acres of winter habitat and 78,264 acres of summer nesting / brooding habitat distributed across the CNF. Suitable habitats are broadly distributed and abundant, but there are gaps of low habitat abundance in some areas.
Franklin's Grouse *(Falcipennis franklinii*)	No	No	Young lodgepole pine stands with interspersed mature spruce.	Approximately 604,187 acres of habitat distributed across the CNF. Suitable habitats are broadly distributed and abundant, but there are gaps of low habitat abundance in some areas.
Large Raptors and Great Blue Heron	Yes	Yes	Bald eagles, herons – larger trees along larger lakes, rivers and wetlands. Northern goshawk - forest mosaic-all forest communities-medium and large tree family group.	Approximately 3,099 acres of bald eagle and heron habitats distributed across the CNF. Late successional riparian forests reduced from historic conditions. Human activities have reduced the effectiveness of source habitats. Approximately 139,340 acres of goshawk habitat distributed across the CNF. There has been a reduction in source habitat and large diameter trees from historic conditions.
Waterfowl	Yes	Yes	Lakes, ponds, rivers, marshes, and wetlands.	Waterfowl were not designated as MIS. However, the Forest Plan (page 4-40) requires that the CNF maintain and enhance waterfowl habitats.

Effects Analysis for Management Indicator Species

Based on the summary of effects in Table 18, the three action alternative are expected to have no impact on MIS, or impacts would be of such small scale / scope that they would not affect the Forest-wide viability of MIS. The project as proposed would be consistent with management direction in the Forest Plan (as amended) for these species and would ensure the continued viability of each of these species on the Colville National Forest.

Table 18. Summary of potential effects of the action alternatives on MIS.

MIS	Summary of effects of the proposed action, and alternatives 1 and 2
Grizzly Bear, Woodland Caribou	Project effects for these species covered in the Biological Assessment for Section 7 Endangered Species Act Compliance (ESA, 2017b).
Elk, Deer	Project would not occur during the critical wintering period. No impacts on special habitats such as wallows, or calving / fawning areas and no impacts on hiding cover or thermal cover stands. Impacts on forage plants would be of such small scale as to be insignificant or discountable. Open road densities would not change as a result of this project. In addition, all of the recreation sites are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic.
Pine Marten, Barred Owl, Woodpeckers	The project will result in minor impacts to vegetation, including removal of several trees at three recreation sites. Very minor or no impacts on essential forest structures such as large live or dead trees, down logs and to on overhead canopy closure. No impacts on old-growth or other late structural stage stands, as these stands will be avoided. The project would not result in a net change of vehicle access for woodcutting, furbearer trapping, or other human uses. Although all of the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic, noise and human activity from construction activities would be slightly elevated from background levels at the recreation sites. Some minor impacts may occur to individuals due to construction disturbance or habitat degradation from clearing.
Trout	No in-water work associated with the project and TESC measures would eliminate sediment entering Sullivan Creek. The project would improve overall long-term habitat conditions for trout through bank stabilization and riparian planting along Sullivan Creek.
Beaver	No in-water work associated with the project. Only minimal impacts on riparian habitat through selective tree falling. In-water work limited in scope and scale. The project would improve overall long-term habitat conditions for beaver through riparian planting along Sullivan Creek. In addition, all of the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic.
Dusky (Blue) Grouse	There is no brood habitat (e.g., meadows, open “park-like stands”) occurring in the project area and no impacts on potential winter roost trees growing along ridgetops. All of the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic.
Large Raptors, Herons	No known raptor or heron nests within the vicinity of the project. Any newly discovered nest would be protected by avoidance. No impacts on large trees around larger lakes, rivers, or wetlands, on potential nest / perch trees in upland areas, or on overhead canopy closure. Due to the short-term duration of the construction activities in a specific location, disturbance from noise should be insignificant. In addition, all of the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic.
Waterfowl	Some individual waterfowl, including fledglings, could be disturbed during work by construction equipment adjacent to Sullivan Creek; however, no in-water work would occur and the spatial extent of construction work at any given time is limited to small areas of the DRS. Nesting would be complete during construction activities. In addition, all of the DRSs are located on or adjacent to an existing, well-traveled road where wildlife is already prone to disturbance from log trucks and other vehicle traffic.

Migratory Birds

Regulatory Framework

The USFWS is the lead federal agency for managing and conserving migratory birds in the United States. However, under Executive Order (EO) 13186, all other federal agencies are charged with the conservation and protection of migratory birds. In brief, this order requires agencies to:

- Integrate bird conservation principles, measures, and practices into agency activities. Avoid or minimize adverse impacts on migratory bird resources when conducting agency actions.
- Ensure that environmental analyses evaluate the effects of agency actions on migratory birds, especially species of concern.
- Restore and enhance the habitat of migratory birds, as practicable.

In January 2001, the USFS and the USFWS developed a Memorandum of Understanding (MOU) regarding the management of landbirds, including migratory birds.

- Consult the current USFWS Birds of Conservation Concern, state lists, and comprehensive planning efforts for migratory birds, when developing the list of species to be considered in the planning process.
- Incorporate migratory bird habitat and population management objectives and recommendations into agency planning processes.
- Strive to protect, restore, enhance, and manage habitats of migratory birds, and prevent the further loss or degradation of habitats on National Forest System lands.

In December 2008, the USFWS released *The Birds of Conservation Concern Report* (USFWS, 2008), which identifies species, subspecies, and populations of migratory and non-migratory birds in need of conservation actions. While all of the bird species included in this report are priorities for conservation action, the report itself makes no finding with regard to whether they warrant consideration for ESA listing. The goal is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions.

Landbirds Addressed in this Analysis

Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues (USFWS, 2008). The project area is located in the Northern Rocky Mountains BCR (BCR 10). Table 19 lists the "birds of conservation concern" for this BCR. Effects of this restoration project on bird species with suitable habitat in the area (shaded rows in the table) are addressed in this analysis.

Table 19. Migratory Birds of Conservation Concern. Potential habitat for species in shaded rows occurs in the project area. Species in shaded rows are addressed in this analysis.

Bird species	Habitat Present?	Documented in the Area?	Preferred Habitats (USFWS, 2008)
Yellow-Billed Cuckoo	No	Yes	Project effects for these species covered in the Biological Assessment for Section 7 Endangered Species Act Compliance (ESA, 2017b).
Bald Eagle	No	Yes	

Bird species	Habitat Present?	Documented in the Area?	Preferred Habitats (USFWS, 2008)
Peregrine Falcon	No	No	These species are addressed earlier in this analysis.
Lewis's Woodpecker	No	No	
White-Headed Woodpecker	No	No	
Swainson's Hawk *(Buteo Swainsoni)*	No	No	Open country including shrub-steppe, prairies, and irrigated farmland with high prey densities.
Ferruginous Hawk *(Buteo regalis)*	No	No	Habitats with low tree densities and topographic relief in sagebrush plains of the high desert and bunchgrass prairies.
Upland Sandpiper *(Bartramia longicauda)*	No	No	Found in Oregon only.
Long-Billed Curlew *(Numenius americanus)*	No	No	Open grassland areas east of the Cascade Mountains. Found in small numbers in estuaries along the coast.
Flammulated Owl *(Otus flammeolus)*	No	No	Ponderosa pine forests and mixed-conifer stands with a mean 67% canopy closure, open understory with dense patches of saplings or shrubs. Grassy openings for foraging.
Black Swift *(Cypseloides niger)*	No	No	Nests on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls and sea caves. Forages over forests and open areas in montane habitats.
Calliope Hummingbird *(Stellula calliope)*	Yes	Suspected	Open shrub / sapling seral stages (8–15 years), meadows, burned areas, and riparian thickets at higher elevations.
Williamson's Sapsucker *(Sphyapicus thryroideus)*	Yes	Suspected	Mid to high elevation, mature open and mixed coniferous / deciduous forests. Snags are a critical component.
Olive-Sided Flycatcher *(Contopus cooperi)*	Yes	Suspected	Open conifer forests (< 40 % canopy cover) and edge habitats where standing snags and scattered tall trees remain after a disturbance.
Willow Flycatcher *(Empidonax trailii)*	No	No	Associated with riparian shrub dominated habitats, especially brushy / willow thickets.
Loggerhead Shrike *(Lanius ludovicianus)*	No	No	Inhabits grasslands, pastures with fence rows, agricultural fields, sagebrush with scattered juniper, and open woodlands. Requires elevated perches throughout for hunting and nesting.
Sage Thrasher *(Oreoscoptes montanus)*	No	No	A sagebrush obligate dependent on large patches and expanses of sagebrush steppe and bitterbrush with shrub heights in the 30–60 cm height. Prefers bare ground over grassy understories.
Brewer's Sparrow *(Spizella breweri)*	No	No	A sagebrush obligate found in shrublands of contiguous big sagebrush, greasewood, rabbitbrush, and shadscale habitats.
Sage Sparrow *(Amphispiza belli)*	No	No	Associated with semi-open evenly spaced shrubs 1–2 m high in big sage up to 6,800 ft. elevation.
McCown's Longspur *(Calcarius mccownii)*	No	No	Rare in OR & WA; prefers dry sparse prairies.

Bird species	Habitat Present?	Documented in the Area?	Preferred Habitats (USFWS, 2008)
Gray Crowned Rosy-finch *(Leucosticte tephrocotis)*	No	No	Found above timberline among bare rock outcroppings, cirques, cliffs, and hanging snowfields.
Cassin's Finch *(Carpodacus cassinii)*	Yes	Suspected	Open, mature coniferous forests of lodgepole and ponderosa pine, aspen, alpine fir, grand fir and juniper steppe woodlands.

Effects Analysis for Migratory Birds

The potential predicted effects of the project to priority habitats for the birds of conservation concern with potential to occur in the project area are shown in Table 20. Based on this discussion, the project would meet the intent of the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000) and all other management direction related to landbirds. The project is not expected to impact the continued viability of landbird species across the Forest.

Table 20. Summary of potential effects of the proposed action and alternatives 1 and 2 to priority habitats for migratory landbirds.

Priority Habitats	Bird Species	Effects of the proposed action and alternatives 1 and 2
Mixed mesic conifer forests, subalpine forests, snags, burned areas	Cassin's Finch, Calliope Hummingbird, Williamson's Sapsucker, Olive-Sided Flycatcher,	Very minor impacts on late structural stage stands or large live and dead trees, involving removal of only several trees at three sites. The project would not improve vehicle access for wood cutting. Insignificant impacts from disturbance from heavy equipment.
Hardwood trees	Williamson's Sapsucker, Cassin's Finch	Few or no impacts on hardwood trees. Insignificant impacts from disturbance from heavy equipment.
Riparian areas	Calliope Hummingbird, Cassin's Finch	Minimal impacts on riparian areas consisting of individual tree removal. Insignificant impacts from disturbance from heavy equipment. Project may benefit species by replanting and restoration of Sullivan Creek riparian areas.

Botany

This section incorporates by reference the Rare Plants Memorandum (Muscari 2014) for the Project. The Rare Plants Memo outlines the botanical survey protocol used to evaluate sites where ground-disturbing activity would occur, evaluates the presence and status of TES, Regionally Sensitive, Washington State sensitive plant species, and noxious weeds in the project area, evaluates potential effects of the project to these species, and prescribes mitigation criteria to minimize effects.

Existing Condition

No federally listed threatened or endangered plants are known or suspected in the project area. Whitebark pine (*Pinus albicaulis*), a federal candidate species for listing was listed as potentially occurring in the analysis area. Based on the habitat requirements of whitebark pine, only the eastern end of the project area, where elevations are above 4,000 feet, has the potential to support this species However, a field survey of the project area, conducted by a qualified botanist, did not detect any occurrences of rare or listed plant species, including whitebark pine (ESA, 2014a). Therefore, this analysis is limited to Region 6 (R6) sensitive species and their habitats. Proposed actions are unlikely to affect sensitive plants if design criteria measures are implemented.

All sites with a 6-foot buffer around proposed work zones were surveyed for sensitive plants. No sensitive plants were positively identified at any of the Sullivan Creek recreation sites. One Colville National Forest sensitive species, kidney-leaved violet (*Viola renifolia*) potentially occurs at many of the study sites, but was not positively identified. Several violet species occur at 22 of the sites and none were in bloom at the time of the survey.

Direct and Indirect Effects of all Alternatives

The analysis area/spatial effects boundary for direct and indirect effects on sensitive plants includes the footprint of activity area disturbances with a 6-foot buffer around work zones.

Threatened, Endangered, or Proposed Plants

Because no occurrences for threatened, endangered, or proposed plants exist in the proposed treatment areas, the proposed action would have no effect to whitebark pine.

Sensitive Plants

No impacts to sensitive plant occurrences are expected with implementation of the design criteria.

Cumulative Effects

Temporal effects in the short term will range from implementation to five to eight years depending on the implementation schedule for the actions. After this time most short-term effects would be diminished. Long-term effects may be apparent ten or more years after implementation. While effects from proposed activities may still be apparent 50 or more years, predicting effects beyond 50 years for botanical resources becomes too speculative for reliable analysis.

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Past activities within the project area have led to habitat modification and fragmentation in and around the project area. Past activities or events that have affected the amount or suitability of sensitive plant habitats include road construction, road maintenance, timber harvest, vehicular traffic, recreational uses, fire suppression, and wildfire. These activities may have resulted in areas becoming unsuitable for sensitive plants by removing the tree canopy or individual plants may have been directly impacted. The effects from these disturbances may have reduced the number of sensitive plant occurrences or suitable habitats within the project area, but there have been no known losses of populations. Past activities have also contributed to encroachment of weeds into the area. Similar to the current proposal, past activities have included design features to help protect and/or mitigate impacts on sensitive plants.

Current ongoing and reasonably foreseeable activities include herbicide spraying for noxious weeds, road maintenance, public use of motorized vehicles, and other recreational activities such

as dispersed camping, berry-picking, hunting, and hiking. These activities could result in direct damage to sensitive plants, indirect effects to sensitive plant habitats, and new disturbed sites available for colonization by weeds.

When the effects of past, present, and reasonably foreseeable activities are combined with the anticipated effects from the proposed activities, sensitive plants may be impacted, but their viability in the planning area is expected to be maintained due to unaffected habitat and occurrences remaining inside the project area and additional occurrences being present near the project area.

Recreation

This report analyzes the direct, indirect, and cumulative effects of treatments on recreation sites in the Sullivan Creek Recreation Sites project area (referred to as the project area in this section). These sites are referred to as Dispersed Recreation Sites (DRSs) in all of the following plans: Proposed Action Restoration Plan (Appendix A), Proposed Action Site Plan (Appendix B), Alternative 1 Restoration Plan (Appendix C), and Alternative 1 Site Plan (Appendix D). For the purposes of this section, recreation sites and DRSs are the same. Appendix E provides a list of all recreation sites with site numbering/names in each alternative.

Relevant Laws, Regulations, and Policy

Regulatory Framework

Land and Resource Management Plan

General management direction for recreation is found in the *1988 Colville National Forest Land and Resource Management Plan* (LRMP). Management Areas (MAs) designations are assigned to each area of the forest in the LRMP. The project area falls within MA-1 Old Growth Dependent Species, MA-2 Caribou Habitat, MA-3A Recreation, and MA-6 Scenic/Winter Range. Guidance specific to these MAs are listed on pages 4-69 to 4-100 of the Forest Plan. The Forest Plan states that the Recreation Opportunity Spectrum (ROS) (USDA 1987) will be used to identify compatible uses and assigns ROS designations to each MA (Table 21).

Table 21. MA and ROS Designations for recreation sites in the project area using the DRS numbering systems

MA	DRS number	ROS Designation	ROS Description
MA-1	6-7	Semi-Primitive Motorized (SPM)*	Area characterized by a predominantly natural or natural appearing environment of 2,500 or more acres, with a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk. Motorized use is permitted.
MA-2	33-38		
MA-3A	1-5 & 11-32	Roaded Natural (RN)*	Area characterized by a predominantly natural or natural-appearing environment with a low probability of experiencing isolation from the sights and sounds of man. Interaction between users may be low to moderate, but with evidence of other users prevalent. Conventional

MA	DRS number	ROS Designation	ROS Description
MA-6	8-10		motorized use is provided for in construction standards and design of facilities. Opportunities for both motorized and non-motorized forms of recreation may be provided.

*Multiple ROS designations apply to some MAs – only designations applicable to the associated DRSs are shown.

Colville National Forest Recreation Strategy

The *Colville National Forest Recreation Strategy* (CNF Rec Strategy) provides general recreation management goals and objectives. The primary goal of the strategy is to maintain and enhance recreation opportunities and settings associated with key pathways across the forest (Colville National Forest 2012). Key pathways include forest byways, backways, and major trail routes identified by forest specialists in 2012 (Colville National Forest 2012). Sullivan Creek Road and the project area falls along one of these key pathways due to its alignment with: the Pacific Northwest National Scenic Trail (PNNST), a primary access route to the Salmo-Priest Wilderness, and a major forest road connecting the Colville National Forest (CNF) to the popular Priest Lake recreation area of the Idaho Panhandle National Forest. In addition, the Sullivan Lake road is also considered a key pathway due to its connection to the Selkirk International Loop and because it is one of the highest dispersed recreation use areas on the CNF.

Best Management Practices

The Forest Service's National Best Management Practices (BMPs) for Water Quality Management on National Forest Lands outlines practices for managing and planning dispersed recreation use around water resources. These practices include using public education to encourage uses that minimize adverse effects to resources, developing/designating sites in appropriate locations, limiting group sizes, providing sanitation facilities in concentrated use areas, closing sites that are causing unacceptable adverse effects, and mitigating adverse effects for open sites (USDA 2012).

Forest Service Accessibility

The Forest Service accessibility website https://www.fs.fed.us/recreation/programs/accessibility provides direction for applicable accessibility laws, regulations, policies and guidelines for new construction, and reconstruction of recreation sites and trails. These guidelines help ensure projects provide the highest level of accessibility for new construction or reconstruction projects while protecting the unique characteristics of the natural setting for outdoor recreation areas and trails. Table 22 provides a quick reference guide for features in the Sullivan Recreation Sites Project. The Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) provides legal requirements for all applicable facilities and features constructed or altered within the National Forest System. Although other guides, laws, or policies may apply, FSORAG would provide the primary guidance for the Sullivan Creek Recreation Sites Project.

Exceptions for meeting accessibility requirements are allowed under some conditions per FSORAG. Accessible fire rings, food storage lockers, or other amenities shall be used for this project regardless if an exception for the recreation site itself is allowed. Consideration for other design options should be considered before exceptions are used (FSORAG 2013). The following are conditions for exceptions allowed under FSORAG:

1. Where compliance is not practicable due to terrain.

2. Where compliance cannot be accomplished with the prevailing construction practices.
3. Where compliance would fundamentally alter the function or purpose of the facility or the setting.
4. Where compliance is precluded by the:
    - Endangered Species Act (16 U.S.C. §§ 1531 et seq.);
    - National Environmental Policy Act (42 U.S.C. §§ 4321 et seq.);
    - National Historic Preservation Act (16 U.S.C. §§ 470 et seq.);
    - Wilderness Act (16 U.S.C. §§ 1131 et seq.); or
    - Other Federal, State, or local law the purpose of which is to preserve threatened or endangered species; the environment; or archaeological, cultural, historical, or other significant natural features.

Table 22. Accessibility Quick Guide* for the Sullivan Recreation Sites

Americans with Disabilities Act (ADA), Architectural Barriers Act (ABA), Accessibility Guidelines (ABAAS = ABA Chapters 1 & 2 and 3 through 10)	**Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)**
Buildings	**Developed Recreation Site Constructed Features**
All buildings, including, but not limited to: • Vault restroom buildings And including components such as: • Doors • Operating controls • Door handles, etc.	Newly constructed or reconstructed: • Fire rings - cooking surfaces • Outdoor recreation access routes • Campsites (tables/cooking pads, parking spurs, tent pads, platforms) • Remote area pit toilets • Trash/recycling containers • Food storage lockers

*This guide is for reference only and may not include all applicable laws, regulations, or policies and may not cover all applicable amenities or components of this project. Final design plans would be reviewed by Forest Service specialists for compliance with current accessibility standards and guidelines before and during project implementation.

Desired Condition

Desired conditions for recreation resources from the Forest Plan and BMPs include:

1. Restore or improve degraded recreation sites to desired conditions consistent with the ROS designations shown in Table 21.
2. Minimize adverse effects on natural resources from recreation use.

Topics and Issues Addressed in This Analysis

Issues

Several existing recreation sites located within the riparian area are causing degradation to natural resources. Use within these sites is increasing streambank erosion, soil compaction, exposed roots, and vegetation loss. Several sites are located within areas identified for future riparian and stream restoration activities including reconnecting relict floodplains with the main channel of Sullivan Creek. Sanitation issues and vandalism to existing site amenities and trees have degraded the recreation setting and increased tree mortality. Several issues were also identified during surveys, site visits, internal reviews, and scoping on the proposed action. These issues include:

1. Recreation use over the past several decades (especially large group use) has resulted in degradation of the recreation setting.
2. Recreation specialists often find food, trash, and other animal attractants unsecured within these sites.
3. The proposed action does not adequately address sanitation issues at the recreation sites.
4. The proposed action does not adequately address impacts from sites within the floodplain or within close proximity to Sullivan Creek.
5. The proposed action is too restrictive for equestrian users at Gypsy Meadows. It does not allow sufficient space or needs for large work groups maintaining trails in the area.

Resource Indicators and Measures

Resource indicators to assess direct, indirect, and cumulative recreation effects include available opportunities, capacity, sanitation, site amenities, and access. Measures include tree root exposure, trash, sanitation issues (i.e. human waste, toilet paper, waste buckets, etc.), vandalism, tree mortality, and streambank erosion from user trails. Measures to assess these indicators include approximate area of bare ground, number of campsites, campsite size, and trash quantities. Many of these measures are based on personal observation from Forest Specialists.

Table 23. Resource Indicators and Measures

Resource Element	Resource Indicator	Measure*
Availability of Recreation Opportunities along Sullivan Creek	Availability of campsites and overnight vehicle parking capacity	Number of campsites along Sullivan Creek
		Number of parking spaces
		Qualitative discussion of potential for user conflicts

Resource Element	Resource Indicator	Measure*
Quality of recreation experience	Quality of Recreation Opportunities	Qualitative discussion of quality of natural environment
		Qualitative discussion of potential changes in management of sites (potential fees, etc.)
	Recreation Amenities	Qualitative discussion of amenities
	Sanitation	Number of campsites within walking distance to a restroom, qualitative discussion of sanitation
	Trailhead Parking	Qualitative discussion and quantitative measure on the availability of adequate space for trail volunteer groups and trail users.
	Fishing and Hunting Opportunities	Qualitative discussion of how hunting and fishing opportunities would differ by alternative
	Developed Recreation opportunities	Qualitative discussion of how the project could affect developed recreation sites.

*See Methodology section for a description of rating criteria for each measure.

Methodology

This analysis provides an estimated rating and/or qualitative discussion to compare the condition of the recreation resource across alternatives. This would serve as a means to determine potential effects to the recreation resource and impacts to the natural resources. The effects analysis in this report compares how each measure differs or is expected to change for each alternative. Most potential effects of the project are indirect and are based on professional judgement and review of social science literature on effects of similar projects on recreation measures (see Appendix A).

Availability and Quality of Recreation Opportunities along Sullivan Creek

Appendix E shows how each recreation site differs in number of campsites and capacity for each alternative. Direct effects of the project on availability of recreation opportunities are analyzed through comparison of the total number of campsites within the project area, estimated number of vehicle spaces available for campsites, and qualitative discussion on compatibility with ROS designations and impacts to other recreation uses.

Overall quality of recreation experience is assessed through:

- Potential for user conflicts based on distances, access, and overlap with other recreation activities or opportunities. This includes, but is not limited to, distance between campsites, day use stream access near campsites, access to trails, and anticipated displacement of recreation users;
- Quality of the natural environment and its contribution to recreation setting;
- How potential fees would facilitate better management and improved recreation conditions.

Recreation Amenities

Available amenities available across the Sullivan Creek Recreation Sites project area help improve the visitor experience, reduce human-animal conflicts, and reduce foot traffic and soil

compact. Amenities include but are not limited to fire rings, food storage lockers, fee stations, and information boards.

Sanitation

Sanitation issues are often directly related to the distance of sites from toilets. This report considers the number of campsites within walking distance of an existing or proposed restroom and a discussion on potential additional effects of sanitation issues.

Potential Vandalism

Vandalism within the project area includes mechanical damage to trees, graffiti, and damage to amenities or other infrastructure. Vandalism detracts from the recreation experience and tends to lead to additional vandalism if problems are not immediately corrected.

Trail Related Opportunities

This report includes a discussion on access to trails/trailheads and parking space for large work crews.

Fishing and Hunting Opportunities

The report includes discussion on how fishing and hunting opportunities would be effected by the project. This includes effects related to the natural setting and stream access. Fish habitat is addressed in the EA and other specialist reports.

Developed Recreation Opportunities

The displacement of recreationists can effect demand on nearby developed sites. This report includes discussions on how alternatives might affect developed recreation within the analysis area.

Incomplete and Unavailable Information

Economic Analysis

Available economic data pertains to the Forest or County as a whole. Economic data and information specific to the project area is not available. The Estimation of National Forest Visitor Spending from National Visitor Use Monitoring (USDA 2013) shows the average party spends approximately $50 per night on overnight stays in undeveloped camping areas. The 2014 Visitor Use Report (USDA 2014) provides use numbers by recreation activity, approximate travel distances, and substitute behavior choices if recreationists were unable to visit this national forest. Substitute behavior choice categories include: coming back another time, going elsewhere for different activity, going elsewhere for same activity, going to work, staying home, or other substitutes. These reports do not show substitute choices on the same forest, where money is spent (i.e. non-local visitors), or use patterns specific to the project area. After evaluating available data, it was determined there was not enough information to predict local economic impacts from the proposed action or alternatives. Economic day use impacts were not analyzed since day use in the project area is not anticipated to change measurably between alternatives.

Attempts to predict economic impacts were based on assumptions that each campsite correlates to capacity for one party, an average use season is 120 days, all trip expenditures are spent in Pend Oreille County, and the annual estimated occupancy rate is 35% (occupancy is based on

comparisons with Edgewater and Panhandle Campgrounds which exhibit similar use patterns from general observations from Forest Service specialists). According to the Economic Analysis of Outdoor Recreation in Washington State (*2015 Earth Economics*), economic spending on all federal lands in Pend Oreille County was approximately $12,600,829. Based on this information, rough spending losses were too small to estimate (less than .2%). Additionally, these assumptions are based on all visitor spending occurring within the county. Since the majority of visitors are non-local, it is likely a portion of current spending occurs outside Pend Oreille County.

Spatial and Temporal Context for Effects Analysis

The Sullivan Recreation Sites project area, Salmo Priest Wilderness, surrounding trail system, and nearby developed sites described in Appendix A were considered in the effects analysis of all alternatives and will be referred to as the analysis area throughout this document. In addition, the socioeconomic effects (see *Incomplete and Unavailable Information* section above) analysis took into consideration Pend Oreille County. The indirect and cumulative effects analysis took into consideration effects to and from the surrounding region.

Affected Environment

Existing Condition

The Sullivan Creek Recreation Sites Initial Restoration Plan (ESA 2014b) and Appendix A describe the existing conditions for the analysis area and individual recreation sites. Although most of the recreation sites along Sullivan Creek are used primarily for camping, some sites are frequently used for fishing or other day use activities. Although day use can occur in any of the sites, the term “day use site” in this effects analysis refer to sites that have designated parking but are closed to camping.

Visitor Use Information

The CNF supports many different recreational activities, both motorized and non-motorized. Per the 2014 National Visitor Use Monitoring (NVUM) results, the most popular activities on the Forest by percent of visitors participating (visitors can participate in more than one activity) are: downhill skiing, hiking/walking, relaxing, developed camping, viewing natural features, other non-motorized, viewing wildlife, gathering forest products, driving for pleasure, and fishing. Primitive camping (same as dispersed camping) accounts for the most hours spent on average as a main activity on the CNF.

The most common recreation activities specific to the project area are primitive camping, fishing, hiking/walking, relaxing, hunting, and driving for pleasure. Although primitive camping accounts for only 3.4% of activity participation forest-wide and 1% as a main activity (down from 5.2% and 1.4% respectively in 2009), it is one of the more popular activities in the projects area. A majority of the recreation sites fill on weekends and many fill on most weekdays from July 4th through Memorial Day.

Primitive camping on the forest accounts for over 14% of all overnight stays within 50 miles of the CNF and camping in developed sites accounts for nearly 66% of overnight stays in this area (NVUM 2014). Additionally, developed sites within the analysis area are the most highly used recreation sites on the CNF.

Environmental Consequences

No Action Alternative

General treatment of the Sullivan Dispersed Recreation Sites was included in the FERC-issued Final Environmental Impact Statement (FEIS), in 2011 to address the effects of Seattle's Boundary dam relicense. However, the no action alternative for the purposes of this analysis assumes there would be no additional treatment of the recreation sites along Sullivan Creek as a means to compare alternatives. The no action alternative is the only alternative where fees are not proposed.

Availability and Quality of Recreation Opportunities along Sullivan Creek

There are currently 45 campsites with capacity for approximately 109 vehicles in the project area. No immediate change would occur in the quality of the dispersed camping, day use activities, trail use, or other recreation experiences in the project area under the no action alternative. However, over time, the setting in which these opportunities exist would likely deteriorate due to vandalism and loss of vegetation from trampling and stream bank erosion, especially within existing designated sites. Stress to trees from vandalism and root compaction may increase susceptibility to disease and infestation, leading to increased mortality rates. The loss of trees and shade would result in a less desirable recreation setting. Not addressing ongoing resource impacts and deterioration at these sites would be inconsistent with management direction in the Forest Plan and CNF Rec Strategy.

Recreation Amenities

All existing sites used for camping include one or more user-created campfire rings. Food storage lockers have been installed at several of the highest use sites. Most of the sites along the Sullivan Creek road are signed with an individual site number. There are a handful of sign boards throughout the project area for posting fire restrictions, forest information, and notices. Most of the designated campsites include barrier rocks to delineate parking areas.

Sanitation

There are 13 sites within walking distance of a restroom. Continuing sanitation and trash issues from a lack of nearby restroom facilities and site management could lead to less desirable camping conditions and potential health and safety concerns in some sites.

Trail Opportunities

Trail use and conditions would remain relatively unaffected under the no action alternative. The majority of trailheads are located further away from the most heavily impacted sites. In addition, the majority of trail users (with hiking being a main activity) do not camp or recreate within the recreation sites with the exception of Gypsy Meadows. Conditions at Gypsy Meadows would remain relatively unchanged both in the short and long-term under current use trends. However, if use at Gypsy Meadows were to increase, sanitation issues, soil compaction, loss of vegetation, and bank erosion could lead to undesirable conditions at this site as well.

Fishing and Hunting Opportunities

Continued degradation of the riparian area and fish habitat could lead to a less productive fishery or setting for anglers. Berry picking, mushroom collecting, and other activities common in the project area are unlikely to be substantially affected by the condition of the recreation sites as these activities generally occur away from the sites themselves. Since hunters often camp in the

Sullivan Creek recreation sites, the potential future loss of sites due to resource or health and safety closures would reduce capacity for hunting camps. However, since many sites are not occupied during the hunting season, any displacement would be expected to be contained to other existing recreation sites in the project area.

Developed Recreation Opportunities

Developed campgrounds in the area may experience increased demand over time if the Sullivan Creek recreation sites become undesirable or closed to due degradation of the resources (i.e. severe erosion, health and safety hazards, sanitation problems, etc.). Many developed sites in the area often fill each night during the peak season (July 1st through Labor Day). No immediate change or effect is anticipated for developed sites if the no action alternative is taken. No Action

Forest Plan Consistency

The majority of the Sullivan Creek recreation sites within the project area fall within MA-3A. The Forest Plan states the management goal of MA-3A is to provide recreation opportunities in a natural appearing setting. Continued degradation and expansion of these sites would be inconsistent with a natural appearing setting. Site degradation would also be incompatible with maintaining and enhancing recreation opportunities and settings associated with major pathways per the CNF Rec Strategy. Although overall conditions for the recreation sites across MA-3A may be compatible or normal with the Road Natural (RN) ROS designation, continued site degradation, sanitation problems, and expansion of denuded areas could lead to inconsistencies or unacceptable RN conditions. Unmitigated streambank erosion in several sites next to the creek could reduce useable recreation space within these sites.

Sites within MA-1 call for a Semi-Primitive Non-Motorized (SPNM) ROS designation but allow for a Semi-Primitive Motorized (SPM) where compatible with wildlife habitat objectives. DRSs 6 and 7 fall within this MA and would be considered under the SPM designation. Current localized conditions at these sites are unacceptable or inconsistent with SPM due to extensive soil compaction, denuded areas, trash, developments, sanitation and social impacts from large groups and heavy vehicle traffic. However, since ROS applies at a macro level, the overall MA-1 area may still be considered consistent with the SPM setting when taking into consideration areas outside the project area.

Sullivan Creek recreation sites within MA-2 are further from the high use recreation areas (i.e. Sullivan Lake) and heavy vehicle traffic areas and are commonly used by wilderness hikers, volunteer groups, and equestrian riders. These sites tend to experience less vandalism and resource damage than other sites within the project area. Current facilities in these sites (i.e. concrete vault toilet, food storage lockers, highline towers, information boards, fire rings, etc.) are typically considered unacceptable or inconsistent with the SPM setting. However, as these developments are limited to a small area within the MA, they do not substantially effect the overall setting and are necessary to protect wildlife, provide public safety, and protect other natural resources.

Over time, conditions in the recreation sites within MA-6 may become inconsistent with the natural setting for RN due to litter, sanitation issues, soil compaction, tree damage, and other impacts occurring from large groups in DRS 10.

Proposed Action Alternative

The proposed action alternative was developed by the Forest Service to address the purpose and need within the restraints of the Forest Plan. The proposed action proposes to implement restoration treatments on the initial 38 sites, adds five new sites for overnight camping to help

offset loss from the closure of other sites, and proposes charging a fee for camping at designated sites. Detailed prescriptions for the proposed action are shown in Appendices A and B.

Availability and Quality of Recreation Opportunities along Sullivan Creek

Direct Effects

The overall number of sites would decrease from 45 to 38 under the proposed action and capacity (number of vehicle parking spaces) would decrease from 109 to 75 (Appendix E). Although overnight use capacity is estimated to decrease, day use levels are estimated to increase by 5% (Appendix A, pg. 119). The number of large sites would decrease from 29% to 22% while the number of medium and small sites would increase from 32% to 35% and 39% to 43% respectively (Appendix A*)*.

Proposed improvements at Gypsy Meadows (adding highline towers and food storage lockers) would improve conditions for many equestrian trailhead users by providing convenient safe food storage and additional capacity for securing equestrian animals on highlines. However, parking and campsite capacity at Gypsy Meadows would be reduced thus restricting large group use.

Indirect Effects

Closures during project implementation could temporarily reduce camping opportunities along Sullivan Creek. However, not all sites would be closed for treatment at the same time, and education efforts would be used to provide advanced notification to inform the public of these temporary closures and impacts associated with construction (heavy equipment traffic, increased noise, etc.).

The recreation setting at the Sullivan Creek recreation sites would improve as bank erosion decreases, vegetation is restored, and sanitation conditions improve. However, conflicts may arise through the implementation of a fee, as only overnight users would be paying fees while day users would have access to the same sites and amenities at no charge.

The collection of fees would provide funding for managing and maintaining site improvements.

Information boards would help educate visitors about protecting the resources to keep recreation opportunities open to the public. These practices are outlined in the Forest Service Watershed BMPs and are consistent with Colville Recreation Strategy goals (USDA 2010 and Colville National Forest 2012). Soil and root compaction, along with tree mortality, would also be expected to decrease under this alternative with reduced parking/driving areas, decompaction of soils, and iceberging. The improved site layout and location of amenities within sites would help facilitate reduced foot and vehicle traffic on vegetated areas, steep slopes, sensitive soils, and tree roots.

Recreation Amenities

Direct Effects

Under the proposed action, campsites would have accessible fire rings, food storage boxes, parking spurs, barrier rocks, and site markers. Site grading and fill may be completed in some sites to provide firm and stable surfaces. Many sites would be reduced in size (primarily parking and tent space).

Indirect Effects

Site improvements (added amenities including fire rings, bear boxes, and an additional restroom) and rehabilitation of heavily impacted areas would restore sites to a more natural setting and reduce human-animal conflicts. Proposed campsite layouts would reduce foot traffic in and around the sites to reduce soil compaction and vegetation loss. Additionally, reducing the overall number of sites and capacity would limit the number of parties and group sizes in the project area which would reduce soil compaction, sanitation problems, and other impacts to the resources, especially those exacerbated by large groups.

Vandalism would be expected to decrease with an increased management and enforcement presence funded through fee collections.

Sanitation

Direct Effects

There would be 20 sites within walking distance of a restroom under the proposed action.

Indirect Effects

Moving recreation use impacts further away from the stream could reduce human waste contaminates from entering the water. Funding from proposed fees would be used to manage sites including more regular cleanup efforts, educating users on proper disposal methods, and enforcement of sanitation regulations.

Trail Opportunities

Indirect Effects

Reducing space at Gypsy Meadows would inhibit large equestrian volunteer groups from operating out of this site. This would lead to a reduction in trail maintenance and thus deterioration of trail conditions as these groups are responsible for a significant portion of major trail work in the area. Gypsy Meadows is one of the few sites on the forest, and one of the only sites in this area, capable of accommodating the needs of large equestrian groups.

Fishing and Hunting Opportunities

Indirect Effects

The quality of other dispersed opportunities within the project area would likely improve with the restoration of sites to more natural conditions. Although some user created paths and individual sites may be closed, overall fishing and general forest access would remain relatively unchanged. Closing sites near the stream would reduce streambank erosion and improve water quality and fish habitat, thus improving recreational fishing. Some hunters who camp for long periods (up to 14 days max) may look for other dispersed opportunities in the area to avoid daily fees.

Developed Recreation Opportunities

Indirect Effects

Both temporary and long-term displacement of campers due to construction or closure/reduction of campsites could lead to increased demand in some nearby sites. However, this demand is expected to be minimal as many dispersed campers are seeking less developed recreation opportunities.

Cumulative Effects

Improvements to FS road 2200 (Pass Creek Pass road) in 2014 slightly increased traffic to the project area from the Idaho Panhandle National Forest based on observations from Forest Recreation Staff. If traffic continues to increase, this could lead to increased use of recreation sites along Sullivan Creek, especially in the upstream portion of the project area (i.e. Gypsy Meadows). Proposed improvements and the collection of fees would help manage additional use.

Temporary closures of some DRSs for in-stream restoration associated with the Sullivan Creek Stream Restoration Project during the 2018 season may displace campers. This could result in other sites receiving increased pressure from the displacement. However, these closures would be timed to reduce impacts to the highest use areas during peak demand periods. Only a few sites would be closed at a time, which would reduce this impact.

On July 20, 2017, the Mill Pond Campground and Historic Day Use Site closed to the public for the Mill Pond Dam Removal and Restoration project. The three site Crescent Lake Campground, which had been closed for three years, was reopened and seven new walk-in campsites were added at East Sullivan Campground to mitigate the closure of the ten Mill Pond Campground sites. With this site-for-site mitigation in place, demand at the recreation sites along Sullivan Creek is not expected to increase from this closure. Mill Pond would be reopened before implementation of the proposed action would occur. The Mill Pond project also resulted in the temporary closure of the Moon Flats site (DRSs 2, 2A, and 3) from August 11, 2017 to August 30, 2017 for staging of material for bank stabilization work along the Sullivan Creek Road. This site is scheduled to be used again for staging during the 2018 summer season, which would temporarily close all three recreation sites again. DRS 2 would likely remain closed most of the 2018 summer season until vegetation is reestablished in the site. Clearing and removal of vegetation for staging may require additional iceberging and barrier rock placement to prevent site expansion. The proposed restroom at Moon Flats would be located in the disturbed area.

Several trails or trail segments within the analysis area were also closed in August 2017 due to fires. Most of these trails would reopen in 2018 although portions may be closed until repairs are made. The effects of these closures are expected to have minimal impact on the amount of long-term hiking use based on observations from similar local fire closures in 2015. The temporary closure of Mill Pond Campground includes approximately 1.5 miles of trail. When reopened in 2018, additional trail miles would be added to provide stream access and a loop trail system.

Future improvements at Mill Pond may result in increased visitation and as a result an increase in demand for the nearby DRSs (1-3). Additionally, gold panning and dredging, which are popular activities in DRS site 1, are expected to increase over the next few years as a result of the dam removal and related release of impounded sediments. Although the dam removal resulted in a loss of lake fishing, the project is anticipated to improve stream fish habitat, which could result in a net increase in fishing use. This anticipated increase in recreation activity at Mill Pond could result in increased demand for overnight and day use in DRS sites 1 through 3 (North Fork Sullivan and Moon Flats). As a result, streambank erosion, soil compaction, and sanitation issues may increase if not addressed. The proposed action calls for restoring and protecting the streambanks while adding capacity at these DRSs. Furthermore, the installation of a restroom at Moon Flats would address sanitation concerns from increased use.

Proposed Action Forest Plan Consistency

Although some proposed developments using synthetic materials (i.e. food storage lockers and restrooms) may be considered inconsistent with SPM on a site-specific level, overall benefits and outcomes from these improvements would align more closely with the SPM setting within the watershed. Natural coverings or screening would be used to help conceal storage lockers and fee tubes where needed to achieve an SPM setting. The reduction in site sizes could reduce the chance of encounters with large groups, thus increasing the opportunity to experience isolation as described under the SPM setting. The proposed action would be considered compatible or normal for the RN designation, which applies to the majority of sites within the project area. The restoration and revegetation of denuded areas within site and improvement of sanitation and trash issues would also create a more natural setting and improve the overall recreation setting.

Although the implementation of a fee program would help maintain the long-term success of restoration efforts to improve the recreation experience, fees may displace some users seeking a free dispersed experience. However, since proposed fees would be relatively low, it is expected this displacement would be minimal. Many users of the existing recreation sites along Sullivan Creek are drawn to the area for the scenic and natural setting as well as its proximity to nearby popular recreation destinations (i.e. Sullivan Lake). Terrain conditions and management efforts would limit additional expansion. Public outreach efforts would be made to help educate users on how fees would be used to improve recreation conditions and keep opportunities available for future generations. Any new user created sites discovered during post monitoring efforts would be closed, rehabilitated, or improved as determined through recreation planning and forest plan direction.

Alternative 1

This alternative modifies the proposed action based on comments received from the public, Pend Oreille County Commissioners, Washington Department of Ecology, and Forest Service Interdisciplinary Team analysis. In addition, alternative 1 adds the addition of amenities commensurate with fees proposed and adds more sites clustered around existing or new restrooms. The effects would be the same as the proposed action with the exceptions below.

Availability of Recreation Opportunities along Sullivan Creek

Direct Effects

The number of campsites would increase over the proposed action (from 40 to 42). Closing DRS 17 would further reduce the number of large campsites within the project area. However, overall capacity under alternative 1 would increase from 72 to 83 versus the proposed action (Appendix E).

Indirect Effects

The new proposed site numbering system would utilize both common place names with numbers (and letters in some locations). This would help distinguish between sites on the Sullivan Creek road and Sullivan Lake road when directing visitors or emergency responders to locations. This numbering system would allow managers to maintain consecutive numbering if new sites are added within an existing spur or loop. Local users and officials indicated a desire to use common place names. Outreach and education efforts should help mitigate any confusion with visitors and emergency responders accustomed to the old site number system.

DRS 14A includes the addition of amenities to support a host site. These amenities are shown in Appendix D. It is uncertain at this point whether or not this location would be suitable for a host due to lack of radio or phone communications and costs associated with funding host programs. This site would be available to the public when not used as a host site. If a host is placed at this site, they would assist with maintenance, daily management, cleaning, fee collections, and monitoring for all recreation sites along Sullivan Creek. Having a host would protect investments from this project and help ensure its success through monitoring and management of the sites. Hosts would be able to provide visitors with brochures and maps including proper food storage, hiking trails, motorized vehicle use maps, etc.

Closing DRS 1 would displace campers seeking opportunities to camp next to the stream near a paved road and eliminate a large capacity campsite. Although sites added to Moon Flats would help offset some of the lost capacity, Moon Flats would not provide a similar streamside setting. Converting DRS 1 to a day use only site would reduce streambank erosion and sanitation problems common at this location and improve compliance with forest BMPs. Day use parking would improve at this site as parking is frequently difficult or not available when campsites are occupied.

Recreation Amenities

Direct Effects

Since there are more campsites under alternative 1 there would be more available amenities within the project area.

Sanitation

Indirect Effects

Directing and concentrating more use at sites with existing or proposed restroom facilities (Moon Flats, DRS 14, and DRS 20) would further improve sanitation conditions in the project area. There are 28 sites within walking distance of a restroom. These actions would help in meeting Forest Service water quality BMPs for managing and planning sites near streams (USDA Apr 2012). However, these sites would be smaller and less private than the current condition and may attract a different user group as they would more closely resemble a standard developed campground.

Trail Opportunities

Indirect Effects

Maintaining the existing capacity at Gypsy Meadows and providing additional highline towers would support large volunteer crews. In turn, this would help maintain trails and access throughout the analysis area.

Fishing and Hunting Opportunities

Indirect Effects

Indirect effects would be same as proposed action.

Developed Recreation Opportunities

Indirect Effects

Indirect effects to developed recreation would be the same as the proposed with the exception of the potential for fewer displaced users (alternative 1 provides more sites) and related chance for users conflicts as a result of displaced campers.

Cumulative Effects

Cumulative effects of alternative 1 are similar to the proposed action with the following exceptions. Converting DRS 1 to day use only would reduce overnight capacity in an area where recreation use is anticipated to increase over the next several due to the Mill Pond recreation improvements. However, additional sites would be added to Moon Flats (DRS 2 through 3) to help offset this loss in capacity. Parking for day use would increase within DRS 1 and conflicts between overnight and day users would be eliminated at this site. Vehicle access adjacent to the stream would be restricted which could make it more difficult to set up dredging equipment.

Alternative 1 Forest Plan Consistency

Consistency with the forest plan would be similar to the proposed action. Additional sites and amenities prescribed in this alternative would be added in the RN designations which is compatible for such developments.

Alternative 2

This alternative would allow camping at sites outside the floodplain and within close proximity to a restroom facility. Day use sites outside the flood plain would remain open. All other sites would be closed and rehabilitated to minimize resource impacts to soil, water, fisheries, and riparian areas. Improvements in sites remaining open would be the same as alternative 1.

Effects are similar to the proposed action and alternative 1, with the following exceptions:

Availability and Quality of Recreation Opportunities along Sullivan Creek

Direct Effects

The number of available campsites and overall capacity would decrease significantly over the proposed action and alternative 1 (Appendix E). The closure of all sites in the riparian area would decrease parking and access for day use. However, although many of the sites would be closed, overall day use is not anticipated to change substantially as most day users would be available to find parking along the road and existing turnouts. One exception would be DRS 1 where access to the stream for fishing, dredging, and panning would be more difficult due to the distance from suitable parking.

Indirect Effects

Impacts to resources (soil compaction, loss of vegetation, etc.) may increase in the remaining open sites from higher use as a result of users being confined to fewer areas. New sites may develop in the project area as users seek to expand capacity on their own. Monitoring and immediate mitigation (see mitigation section below) would be needed to prevent these issues.

Degradation from use along the riparian area would be substantially reduced as sites in these areas would be closed. Tree mortality and damage from vandalism and soil compaction would also decrease in the Sullivan Creek flood plain.

Recreation Amenities

Direct Effects

There would be fewer overall amenities since there are fewer sites.

Indirect Effects

Fewer amenities would reduce long-term operation and maintenance costs. However, fewer sites would also result in reduced fee collections for maintaining the entire project area.

Sanitation

Direct Effects

There are 28 sites in alternative 2 located within walking distance of a restroom.

Indirect Effects

Sanitation would likely improve with reduced use and the majority of available sites being located near restroom facilities.

Trail Opportunities

Indirect Effects

The indirect effects would be the same as alternative 1.

Fishing and Hunting Opportunities

Indirect Effects

The indirect effects would be the similar to the proposed action except access may be more difficult in some areas with the closure of all riparian campsites. However, parking along the road and turnouts would still be available. The setting for fishing may improve with reduced streambank erosion caused by current heavy recreation use within riparian campsites.

Developed Recreation Opportunities

Indirect Effects

Developed campgrounds may become more crowded as use is displaced. Since the Sullivan Recreation Sites project area is one of the most heavily used dispersed campsite areas on the forest, overnight stays on the CNF may decrease. This could be offset if use is redirected to underutilized campgrounds and other dispersed camping areas immediately outside the Sullivan analysis area. Overnight stays are often used when measuring impact to local economies. However, as mentioned previously in this report, economic data is not available for determining impacts.

Cumulative Effects

Same as the proposed action with following exceptions. The complete closure of DRS 1 would eliminate vehicle access for gold panners, dredgers, and other day users. User created access points along the creek may develop as users seek access to the water.

Alternative 2 Forest Plan Consistency

Increased restoration acreage and reduced recreation impacts/use would further improve the natural setting and opportunities to experience solitude in the SPNM setting.

Summary of Environmental Effects

Table 24 is a summary comparison of the potential effects to recreation of all alternatives.

Table 24. Effects Summary Comparison of the Alternatives for the recreation resource.

Resource Element	Resource Indicator	Measure*	No action	Proposed action	Alternative 1	Alternative 2
Availability of Recreation Opportunities along Sullivan Creek	Availability of campsites, parking, and day use opportunities	Number of campsites along Sullivan Creek	45	38	43	29
		Number of parking spaces	109	75	85	53
Quality of recreation experience	Quality of Recreation Opportunities	Qualitative discussion of potential for user conflicts	Continued use by large groups may increase user conflicts	Improved Management and reduction of large party sites could reduce user conflicts in dispersed sites. Displacement of visitors may increase conflicts in other nearby sites.	Same as proposed except more opportunities within the project area would reduce conflicts outside the project area as fewer visitors would be displaced.	Reduced use would likely reduce user conflicts in the project area. However, conflicts may increase substantially in surrounding areas as visitors compete for fewer available sites.
		Qualitative discussion of quality of natural setting	Continued degradation of natural setting	Helps prevent continued deterioration. Restores many areas with existing issues.	Same as proposed except restores additional riparian sites.	Restores all sites in floodplain to natural conditions.

Resource Element	Resource Indicator	Measure*	No action	Proposed action	Alternative 1	Alternative 2
		Qualitative discussion of potential changes in management of sites (potential fees, etc.)	No change	Increased management presence and maintenance through fee collections.	Same as proposed except 5 additional sites to manage. Clustering sites near restrooms would reduce labor.	Same as Alt 1 except 14 fewer sites to manage.
	Recreation Amenities* **FSL = Food Storage Locker* *AFR = Approved FS fire ring*	Qualitative discussion of amenities	12 FSLs in the project area. No campsites with AFRs. Many sites do not have well defined firm and stable parking or use areas.	All 38 campsites would have FSLs, AFRs, and well-defined firm and stable parking and use areas.	All 43 campsites would have FSLs, AFRs, and well-defined firm and stable parking and use areas.	All 29 campsites would have FSLs, AFRs, and well-defined firm and stable parking and use areas.
	Sanitation	Number of campsites within walking distance to a restroom, qualitative discussion of sanitation	13 sites	20 sites	28 sites	28 sites
	Gypsy Meadows equestrian group size capacity	Qualitative rating of site capacity for equestrian groups	Capacity meets current demand.	Reduced capacity would not be adequate for typical volunteer groups maintaining system trails.	Capacity would meet current demand and future needs.	Same as Alt 1.
	Fishing and Hunting Opportunities	Qualitative discussion of how hunting and fishing opportunities would differ by alternative.	Continued deterioration of riparian areas would lead to less desirable setting.	Restoration of riparian areas could improve setting.	Restoration of riparian areas and closure of DRS 17 could substantially improve setting.	Alt 2 provides the greatest improvement to the riparian area and setting.

Resource Element	Resource Indicator	Measure*	No action	Proposed action	Alternative 1	Alternative 2
	Developed Recreation opportunities	Qualitative discussion of how the project could affect developed recreation sites.	Little to no immediate change on developed sites.	Loss of campsites and capacity could lead to minor increase in demand on developed sites.	Little or no change anticipated on developed sites.	Closure of many sites could little to minor to moderate increase in demand at developed sites.

Other Resources Considered and Findings

Visual Quality Objectives

Visual Quality Objectives (VQO) were used in the Forest Plan to describe a desired level of scenic quality, and diversity of natural features, based on physical and sociological characteristics of a specific management area. The objective for each management area refers to the degree of acceptable alteration of its characteristic landscape. The VQO within the Sullivan Creek Recreation Sites project area is for retention. In the retention VQO, human activities are not evident to the casual Forest visitor. Activities may only repeat the forms, lines, color, and textures, which are frequently found in the characteristic landscape. The project would meet VQOs; site designs emulate the landscape to the extent possible in recreation sites within close proximity to the Sullivan Creek Road.

Noxious Weeds

General locations for noxious weeds on the Pend Oreille County list (POCWB, 2015) were recorded during field surveys for rare plants. Invasive plant species were observed in several campsites and along roadways. Noxious weeds were not observed in the forest and riparian areas dominated by native vegetation. Species observed include the following: Canada thistle (*Cirsium arvense*), Saint Johnswort (*Hypericum perforatum*), oxeye daisy (*Leucanthemum vulgare*), and common tansy (*Tanecetum vulgare*). All of these species are Class C on the Washington State list (WSNWCB, 2018) and Category II in Pend Oreille County. Weeds in Category II are common in Pend Oreille County and are controlled on rights-of-way as necessary, with the overall goal of containment and reducing the negative impact to an acceptable level. Design elements detailed in Chapter 2 of this document would avoid additional introduction or spread of noxious weeds, and contain existing occurrences.

Cultural Resources

This section incorporates by reference the Cultural Resources Report for the Sullivan Creek Recreation Sites project (Ostrander 2017). Existing and potential new recreation sites along Sullivan Creek were surveyed using surface and subsurface methodologies for cultural resources in 2014, 2015, and 2016. Based on the findings in the Cultural Resources Assessment, the cooperating partners will endeavor to flag and avoid all known historic resources in the project area per the design elements listed in Chapter 2. Additionally an Inadvertent Discovery plan will be in place prior to implementation.

Range

There are no range allotments in the project area, and there are no effects to rangeland or range resources from the project.

Other Required Analyses

Effects on Consumers, Civil Rights, Minority Groups and Women (Includes Environmental Justice Analysis)

All contracts and employment offered by the Forest Service contain Equal Employment Opportunity requirements. Therefore, no adverse or discriminatory effects to Civil Rights, Minority Groups, or Women are expected with regards to access to federal contracts or jobs.

Executive Order 12898 of February 16, 1994 focuses federal attention on the environmental and human health effects of federal actions on minority and low-income populations to achieve environmental protection for all communities. Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment. In examining the Sullivan Creek Recreation Sites project, one potential "population" that may be affected; low-income residents of Pend Oreille County.

Low Income Residents of Pend Oreille County

The fee charged at the Sullivan Creek recreation sites would likely affect low-income residents of Pend Oreille County, due to the conversion of free sites to fee site. However, collection of funds would provide a safer and sanitary camping experience through more effective management of human waste and hazard trees that would benefit low-income Pend Oreille County residents. In addition, there are other free dispersed camping opportunities in the area.

National Forest Management Act

The National Forest Management Act (NFMA) includes provisions applicable to all projects and requires the following: (a) resource plans and permits, contracts and other instruments shall be consistent with the forest land management plan; (b) ensure consideration of the economic and environmental aspects of management, to provide for outdoor recreation, range, timber, watershed, wildlife, and fish; and (c) provide for diversity of plant and animal communities. All of these considerations and requirements are addressed in this Environmental Assessment where applicable, and the various resource reports in the project analysis file. Therefore, project actions are consistent with the provisions of NFMA.

Endangered Species Act of 1973, as Amended

The purpose of this act is to provide for the conservation of endangered fish, wildlife, plants, and their habitats. Biological Assessments must be prepared to document possible effects of proposed activities on endangered and threatened species within the analysis area potentially affected by the project. The Project complies with EAS--appropriate coordination, conferencing, and

consultation with the US Fish and Wildlife Service would be completed prior to any decisions as a result of this document.

National Historic Preservation Act and Treaty Resources

This act requires federal agencies to consult with the State Historical Preservation Office and American Indian Tribes before cultural resources, such as archaeological sites and historic structures are damaged or destroyed. Section 106 of this act requires federal agencies to review the effects project proposals may have on cultural resources in the project area. The Project was reviewed by the Forest heritage resources program manager and complies with the Historic Preservation Act and associated executive orders and tribal policy and regulation.

Effects on Farmland, Rangeland and Forestland

The Sullivan Creek Recreation Sites project area contains no prime farmland or prime rangelands as defined in Forest Service Handbook 1909.15, section 65.21.

Clean Water Act

The Clean Water Act is the principal law regulating pollution in the Nation's waters. The project complies with Federal Clean Water Act requirements. The Hydrology section of Chapter 3 of this document includes a detailed discussion of Clean Water Act requirements and project compliance.

Effects on Wetlands and Floodplains

Executive Orders 11988 and Executive Order 11990 require protection of floodplains and wetlands, respectively. One of the goals of the project is to move recreation sites out of sensitive areas, including wetlands, and minimize impacts of recreation on wetlands along Sullivan Creek. The project is located primarily in the floodplain of Sullivan Creek, outside of wetlands. The project is intended to avoid long and short-term adverse impacts associated with floodplains and wetlands by managing recreational use within the floodplain. Project treatments are designed to avoid wetlands and to prevent further degradation of wetland features. The project is compliant with these EOs.

Floodplain Management, EO 11988 of May 24, 1977

This order requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practical alternative. The majority of existing recreation sites are located in the floodplain of Sullivan Creek. One of the goals of the project is to move sites from the floodplain where impacts cannot be mitigated. All new recreation sites are located outside of the floodplain. The project is compliant with this EO.

CHAPTER 4: Consultation with Others

The opportunity for participation in the analysis of this project was initiated through a scoping letter sent on July 18, 2016, to the public, including adjacent landowners, Federal, State, and local agencies, Tribes, and other non-Forest Service persons and interested parties. The scoping period was extended to provide more time for all interested parties (July 15, 2016 through September 22, 2016. The project was also listed in the Colville National Forest's Projects Publication (first

published October 2016 through the present). Field trips with interested individuals and groups occurred on July 27, 2016 and August 14, 2015. Meetings to discuss site design with the Backcountry Horsemen of Washington and the North Idaho Mule Club and Forest Service personnel occurred at the Colville National Forest Supervisor's Office on November 17, 2015.

The Forest Service consulted with Federal, State, and local agencies, Tribes and non-Forest Service persons, including adjacent landowners, during the development of this environmental assessment. Input was received from the following groups and individuals:

The Spokane Tribe of Indians
Karen Skoog, Steve Kiss, and Mike Manus, Pend Oreille County Commissioners
Washington State Department of Ecology
Eric and Pat Gordon
Holly Elliott
Robert and Lea Williams
Dennis Brown
Joe Urness
Robert Gish
Darrell Wallace
James Hudkins
Additional collaboration on project planning included:
Stuart Nieman
Bruce Foreman
Rick Larson
Sonya Scouflair

Letters, meeting notes and documentation of phone conversations from the above individuals are in the public involvement section of the analysis file for this project.

Forest Service Contributing Personnel:

The following Interdisciplinary Team members participated in the preparation of the Sullivan Dispersed Recreation Sites Environmental Assessment:

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Alicia Beat	Forest Archaeologist
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Kevin Walton	Recreation/Hydropower Project Manager
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Tessa Chicks	Writer/Editor
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Other Contributing Personnel

Environmental Science Associates

Jessica Redman	Ecologist
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Andrew Haas	Senior Capital Project Manager, Seattle City Light

Appendices

Appendix A Proposed Action Restoration Plan

Appendix B Proposed Action Site Plan

Appendix C Alternative 1 Restoration Plan

Appendix D Alternative 1 Site Plan

Appendix E Recreation Site Comparisons by Alternative

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List of Acronyms

BA	Biological Assessment (plants, fish, wildlife)
BiOp	Biological Opinion
BMP	Best Management Practice (water)
BMU	Bear Management Unit
CFR	Code of Federal Regulations
CMU	Caribou Management Unit (wildlife
CNF	Colville National Forest
CR	County Road
DEIS	Draft Environmental Impact Statement
DOE	Department of Ecology
DRS(s)	Dispersed Recreation Site(s)
EA	Environmental Assessment
EFH	Effective Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESA	Environmental Science Associates (contractor who completed project site plans)
FAMP	Fish and Aquatics Management Plan
FAWG	Fish and Aquatics Working Group
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FS	Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System (computerized mapping and analysis software)
HU	Hydrologic Unit
HUC	Hydrologic Unit Code
ID or IDT	Interdisciplinary Team
INFISH	Inland Native Fish Strategy
LAU	Lynx Analysis Unit
LRMP	Land and Resources Management Plan, also known as the Forest Plan
MA	Forest Plan management area
MIS	Management Indicator Species (wildlife)
MSA	Magnuson-Steven Fish Conservation Management Act
MVUM	Motor Vehicle Use Map (recreation)
NEPA	National Environmental Policy Act of 1969
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places (heritage)
OHV	Off-highway Vehicle
PCE	Primary Constituent Elements (fisheries)
PHS	Priority Habitats and Species (wildlife)
PUD	Public Utility District
RHCA	Riparian Habitat Conservation Area (fish and hydrology)

RMO	Riparian Management Objective (fish)
RNA	Research Natural Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum (recreation)
SCL	Seattle City Light
SHPO	State Historic Preservation Office (cultural resources)
SOPA	Schedule of Proposed Actions
SUP	Special Use Permit
TES	Threatened, Endangered and Sensitive (wildlife, plants)
TMDL	Total Maximum Daily Load (hydrology)
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service (wildlife)
VQO	Visual Quality Objective (scenery management)
WADNR	WA State Department of Natural Resources